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Introduction
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The latest routine international evaluation for conformation traits took place
as scheduled at the Interbull Centre. Data from twenty five (26) countries were
included in this evaluation.

International genetic evaluations for calving traits of bulls from
Australia, Belgium, Canada, Switzerland, Czech Republic, Germany, Denmark-Finland-Sweden,
Spain, France, United Kingdom, Hungary, Ireland, Italy, Japan, Korea, The Netherlands, Norway,
New Zealand, Poland, South Africa, Estonia, Slovenia, Portugal, and United States of America were computed.
Brown Swiss, Guernsey, Holstein, Jersey  and Red Dairy Cattle breed
data were included in this evaluation.


The WHFF trait definitions are available on this link http://www.interbull.org/ib/conf_trait_hol_jer

The following is a list of substitute traits as applied by countries:
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COU	BRD	TRT_Code	TRT_NAME	Subs_Trt
USA	BSW	ofr	overall frame	sta
USA	BSW	oru	overall rump	rwi
USA	BSW	rle	rump length	rwi
USA	BSW	thp	thurl position	rwi

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Changes in national procedures
-------------------------------------------------------------------------------
Changes in the national genetic evaluation of conformation traits are as
follows:
NOR (RDC)       implementing new models and data extraction pipeline, except for ftl and ocs.
                Repeatability models, as lactations later than first are included from 2015;
                Technicians now score whole herds rather than randomly chosen 1st lactation daughters
                in a progeny testing scheme; New parameters, heritabilities and multitrait constellations;
                New fixed effects and definition of genetic groups; ruh,ude and ftp changed definition
                in 2010. Instead of new and old trait being run multitrait, they have now been scaled to
                join as one trait. Data extraction have stricter tests than before and many bulls loose
                less than 5 daughters. We observe however, that there is a local problem for some bulls
                born around 2002 that may loose up to 35 daughters. The definition and weights used to
                construct OFL and OUS have been changed. For OUS, this implies that lot of old bulls
                disappear as they have not been scored for many of the new component traits Some bugfixes             in extraction pipeline caused many bulls to loose 1 to 5 daughters, at most 13
                compared to the testrun.
SVN (ALL)       Some changes in information due to changes in data base related to the pedigree
                completness and phenotypic data improvement.
FRA (ALL)       Some drops in information due to corrections made in pedigree
AUS (ALL)       Decrease in information as a result of data clean up such as pedigree changes, causing
                also changes in type of proofs. Change of status of bull which leads to a good number of
                bulls no longer being qualified. Decreases in EDC due to rounding.
ITA (HOL)       Decrease in information due to normal editing
DEA (BSW)       Base change
USA (HOL)       Decrease in information due to genomic testing and parentage checks
JPN (HOL)       Drops in information due to parentage checks
BEL (HOL)       Some decrease in information due to pedigree correction
CHE (HOL)       In-depth corrections and renewal of the database table containing bull information by
                one of our breeding associations lead to changes in status of bulls and type of proof as
                well as a fewer number of EBV delivered. Slight changes in number of daughters, number
                of herds and EDC are due to manual edits in the database.
CAN (HOL, JER, RDC)     ous, ofl and ocs are now calculated as a composites instead of evaluated directly
LVA (HOL, RDC)  First time with conformation
NZL (ALL)       Daughter counts â\200\223 affects all traits. New Zealand has continuous DNA parentage testing so
                daughters will always change
                Herd Count â\200\223 affects all traits. Affected by continuous DNA parentage testing.
                EDCs â\200\223 affects all traits. Affected by continuous DNA parentage testing and a bug was
                found in the EDC calculation so a fix was applied
NZL (ALL)       As above plus: same models as what used before just running on Bolt software, there are 4
                models running estimating Management traits, Body Traits, Udder traits and a standalone
                Teat Length model. There are extra changes to daughter counts and herd counts for TOP as
                there needs to be a record for all of the traits in each of the model which has meant
                that some records have been dropped.
PRT (HOL)       Slight change in heritability
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INTERBULL CHANGES COMPARED TO THE PREVIOUS ROUTINE RUN

Post-processing Windows:

According to the decision taken by ITC in Orlando (2015) to review the
post-processing windows every 5 years, during the 2020 the relative working group
has been re-activated and new windows have been identified.

As before, the upper bounds have been set to 0.99 as these were judged to have
very little effect on evaluations while the lower values have been reduced
to the 10th percentile. This reduction would provide post-processed correlations to be closer to the
real estimated ones. Over the past five years, in fact, the previous adopted lower value (25th percentile) had been found too high
causing estimated and post-processed correlations to differ significantly from each other.
The new lower values have been applied to all breeds and traits.

The weight assigned to the magnitude of the changes tested by each country has also been revised. The new weight will allow post-processed correlations
to take more in consideration the value of the new estimated ones even when no changes are applied by the countries.
The new weights are as follows:
No changes   :: 2
Small changes:: 1
Big changes :: 0

More information can be read on https://interbull.org/ib/rg_procedure

DATA AND METHOD OF ANALYSIS

Data were national genetic evaluations of AI sampled bulls with at least
10 daughters or 10 EDC (for clinical mastitis and maternal calving traits at least
50 daughters or 50 EDC, and for direct calving traits at least 50 calvings or 50 EDC) in at
least 10 herds. Table 1 presents the amount of data included
in this Interbull evaluation for all breeds.

National proofs were first de-regressed within country and then analysed
jointly with a linear model including the effects of evaluation country,
genetic group of bull and bull merit. Heritability estimates used in both
the de-regression and international evaluation were as in each country's
national evaluation.

Table 2 presents the date of evaluation as supplied by each country

Estimated genetic parameters and sire standard deviations are shown in APPENDIX I
and the corresponding number of common bulls are listed in APPENDIX II.

SCIENTIFIC LITERATURE

The international genetic evaluation procedure is based on international work
described in the following scientific publications:

International genetic evaluation computation:
     Schaeffer. 1994. J. Dairy Sci. 77:2671-2678
     Klei, 1998. Interbull Bulletin 17:3-7

Verification and Genetic trend validation:
     Klei et al., 2002. Interbull Bulletin 29:178-182.
     Boichard et al., 1995. J. Dairy Sci. 78:431-437

Weighting factors:
     Fikse and Banos, 2001. J. Dairy Sci. 84:1759-1767

De-regression:
     Sigurdsson and G. Banos. 1995. Acta Agric. Scand. 45:207-219
     Jairath et al. 1998. J. Dairy Sci. Vol. 81:550-562

Genetic parameter estimation:
     Klei and Weigel, 1998, Interbull Bulletin 17:8-14
     Sullivan, 1999. Interbull Bulletin 22:146-148

Post-processing of estimated genetic correlations:
     Mark et al., 2003, Interbull Bulletin 30:126-135
     Jorjani et al., 2003. J. Dairy Sci. 86:677-679
     https://wiki.interbull.org/public/rG%20procedure?action=print

Time edits
     Weigel and Banos. 1997. J. Dairy Sci. 80:3425-3430

International reliability estimation
     Harris and Johnson. 1998. Interbull Bulletin 17:31-36

NEXT ROUTINE INTERNATIONAL EVALUATION

Dates for the next routine evaluation can be found on
http://www.interbull.org/ib/servicecalendar.

NEXT TEST INTERNATIONAL EVALUATION

Dates for the next test run can be found on
http://www.interbull.org/ib/servicecalendar.

PUBLICATION OF INTERBULL ROUTINE RUN

Results were distributed by the Interbull Centre to designated
representatives in each country. The international evaluation file comprised
international proofs expressed on the base and unit of each country included
in the analysis. Such records readily provide more information on bull
performance in various countries, thereby minimizing the need to resort to
conversions.

At the same time, all recipients of Interbull results are expected to honor
the agreed code of practice, decided by the Interbull Steering Committee,
and only publish international evaluations on their own country scale.
Evaluations expressed on another country scale are confidential and may only
be used internally for research and review purposes.

PUBLICATION OF INTERBULL TEST RUN

Test evaluation results are meant for review purposes only and should not be
published.

^LTable 1. National evaluation data considered in the Interbull
evaluation for conformation traits (December Routine Evaluation 2021).
Number of records for stature by breed

Country	BSW	GUE	HOL	JER	RDC	SIM
AUS		45	3847	742	240	
BEL			1624			
CAN	239	100	12143	785	876	
CHE	2821		2947	47		
CZE			4229			
DEA	3626					
DEU			19931		241	
DFS			12116	2048	6333	
ESP			4158			
EST			791			

```
FRA           382                    17167
FRM
GBR            21        219          6214          448           322
HUN                                  2818
IRL                                  1788
ISR
ITA          2159                    8848          101
JPN                                  5972
KOR                                  1426
LTU
LVA                                  1194                        601
NLD           128                   15063           47            52
NOR                                                             2436
NZL                                  6648         4078           581
POL                                  8939
PRT                                  2120
SVK
SVN           324                     589
URY
USA           890        701         33293        4334           261
ZAF                                   851          549
HRV
CAM                                                               36
=====================================================================================
No.Records   10590      1065        174716       13179         11979
Pub. Proofs   8487       906        138805       11458         12677          0
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^LAPPENDIX I. Sire standard deviations in diagonal and genetic correlations below diagonal
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-------------------------------------------------------------------------------------
BSW    sta
-------------------------------------------------------------------------------------
         CAN     CHE     FRA     ITA     NLD     USA     DEA     SVN     GBR
CAN      6.34
CHE      0.95   12.41
FRA      0.98    0.96    0.92
ITA      0.96    0.95    0.95   14.15
NLD      0.95    0.95    0.96    0.92    4.15
USA      0.98    0.95    0.97    0.95    0.94    1.63
DEA      0.96    0.98    0.97    0.96    0.95    0.96   11.29
SVN      0.92    0.90    0.90    0.93    0.91    0.90    0.92   15.81
GBR      0.96    0.93    0.95    0.93    0.93    0.95    0.90    0.89    0.86


-------------------------------------------------------------------------------------
BSW    cwi
-------------------------------------------------------------------------------------
         CAN     CHE     FRA     ITA     NLD     USA     DEA     SVN     GBR
CAN      8.14
CHE      0.90   10.23
FRA      0.87    0.90    0.94
ITA      0.81    0.85    0.87   21.58
NLD      0.91    0.82    0.87    0.71    4.58
USA      0.89    0.90    0.92    0.85    0.82    0.91
DEA      0.88    0.82    0.82    0.75    0.81    0.79   11.40
SVN      0.88    0.87    0.86    0.85    0.81    0.87    0.89   22.62
GBR      0.91    0.84    0.82    0.72    0.90    0.81    0.80    0.81    1.41


-------------------------------------------------------------------------------------
BSW    bde
-------------------------------------------------------------------------------------
         CAN     CHE     FRA     ITA     NLD     DEA     SVN     GBR     USA
CAN      6.81
CHE      0.84   10.33
FRA      0.72    0.87    0.92
ITA      0.78    0.91    0.91   17.89
NLD      0.82    0.85    0.86    0.85    4.24
DEA      0.80    0.90    0.92    0.90    0.83   11.22
```

```
SVN      0.78    0.74    0.80    0.83    0.79    0.73   25.60
GBR      0.86    0.89    0.81    0.85    0.90    0.87    0.85    1.72
USA      0.72    0.75    0.86    0.78    0.86    0.79    0.78    0.86    0.84
```

BSW   ang

```
         CAN     CHE     FRA     NLD     USA     GBR
CAN      8.43
CHE      0.69   11.00
FRA      0.87    0.67    0.86
NLD      0.80    0.68    0.70    3.74
USA      0.87    0.67    0.78    0.77    1.09
GBR      0.89    0.77    0.80    0.83    0.90    0.74
```

BSW   ran

```
         CAN     CHE     FRA     ITA     NLD     USA     DEA     SVN     GBR
CAN      6.84
CHE      0.94   10.65
FRA      0.97    0.96    0.95
ITA      0.94    0.93    0.94   23.01
NLD      0.95    0.92    0.96    0.92    4.51
USA      0.97    0.94    0.97    0.91    0.95    1.36
DEA      0.96    0.94    0.95    0.95    0.92    0.97   11.85
SVN      0.91    0.89    0.90    0.90    0.91    0.91    0.90   21.50
GBR      0.96    0.94    0.97    0.94    0.96    0.96    0.92    0.92    1.80
```

BSW   rwi

```
         CAN     CHE     FRA     NLD     USA     DEA     GBR     SVN     ITA
CAN      6.79
CHE      0.89   10.19
FRA      0.96    0.87    0.98
NLD      0.93    0.86    0.93    3.99
USA      0.91    0.84    0.87    0.80    0.97
DEA      0.92    0.89    0.93    0.79    0.90   13.31
GBR      0.93    0.85    0.92    0.88    0.93    0.83    1.32
SVN      0.90    0.81    0.94    0.86    0.83    0.90    0.86   26.66
ITA      0.88    0.80    0.90    0.80    0.85    0.87    0.88    0.88   20.09
```

BSW   rls

```
         CAN     CHE     FRA     ITA     NLD     USA     DEA     SVN     GBR
CAN      7.75
CHE      0.92   13.08
FRA      0.91    0.91    1.01
ITA      0.91    0.86    0.93   23.83
NLD      0.88    0.84    0.88    0.84    5.11
USA      0.95    0.93    0.90    0.86    0.86    0.82
DEA      0.92    0.91    0.92    0.89    0.82    0.91   12.24
SVN      0.86    0.82    0.89    0.86    0.83    0.86    0.89   21.78
GBR      0.84    0.86    0.91    0.83    0.86    0.83    0.88    0.82    1.37
```

BSW   fan

```
         CAN     CHE     FRA     ITA     NLD     USA     DEA     SVN     GBR
CAN      8.90
CHE      0.67   13.82
FRA      0.78    0.72    1.11
ITA      0.69    0.85    0.80   21.71
NLD      0.74    0.68    0.84    0.70    5.19
USA      0.82    0.72    0.85    0.85    0.81    0.87
DEA      0.62    0.91    0.66    0.89    0.64    0.65   11.63
SVN      0.67    0.84    0.70    0.85    0.65    0.69    0.94   24.67
```

```
GBR       0.81    0.71    0.90    0.74    0.88    0.83    0.69    0.70    1.21

-----------------------------------------------------------------------------------
BSW    hde
-----------------------------------------------------------------------------------
          CAN     CHE     FRA     ITA     NLD     DEA     SVN     USA
CAN       8.28
CHE       0.87   12.59
FRA       0.83    0.81    1.17
ITA       0.80    0.83    0.85   21.79
NLD       0.77    0.74    0.84    0.75    5.19
DEA       0.79    0.87    0.85    0.93    0.77   12.20
SVN       0.76    0.76    0.84    0.89    0.73    0.90   30.22
USA       0.85    0.74    0.85    0.89    0.81    0.78    0.82    0.87

-----------------------------------------------------------------------------------
BSW    fua
-----------------------------------------------------------------------------------
          CAN     CHE     FRA     ITA     NLD     USA     DEA     SVN     GBR
CAN       6.97
CHE       0.87   12.02
FRA       0.89    0.87    0.88
ITA       0.89    0.83    0.85   20.74
NLD       0.90    0.85    0.90    0.84    4.59
USA       0.94    0.86    0.87    0.93    0.87    1.31
DEA       0.84    0.85    0.94    0.83    0.81    0.84   11.20
SVN       0.75    0.75    0.84    0.84    0.77    0.75    0.90   21.26
GBR       0.92    0.85    0.88    0.88    0.91    0.92    0.77    0.63    1.25

-----------------------------------------------------------------------------------
BSW    ruh
-----------------------------------------------------------------------------------
          CAN     CHE     FRA     ITA     NLD     USA     DEA     SVN     GBR
CAN       7.55
CHE       0.91   11.90
FRA       0.85    0.83    0.93
ITA       0.75    0.85    0.86   13.17
NLD       0.77    0.85    0.87    0.86    4.22
USA       0.84    0.83    0.88    0.87    0.87    1.08
DEA       0.81    0.86    0.90    0.93    0.89    0.85   11.78
SVN       0.82    0.84    0.80    0.87    0.89    0.83    0.89   19.38
GBR       0.74    0.80    0.86    0.84    0.88    0.91    0.77    0.76    1.61

-----------------------------------------------------------------------------------
BSW    ruw
-----------------------------------------------------------------------------------
          CAN     CHE     FRA     ITA     NLD     USA     DEA     SVN
CAN       8.13
CHE       0.91   11.93
FRA       0.85    0.86    0.85
ITA       0.79    0.88    0.79   13.44
NLD       0.69    0.66    0.79    0.69    4.22
USA       0.86    0.89    0.85    0.89    0.79    1.03
DEA       0.85    0.91    0.75    0.95    0.55    0.90   12.28
SVN       0.82    0.82    0.76    0.85    0.70    0.82    0.84   17.66

-----------------------------------------------------------------------------------
BSW    usu
-----------------------------------------------------------------------------------
          CAN     CHE     FRA     ITA     NLD     USA     DEA     SVN     GBR
CAN       8.53
CHE       0.90   12.00
FRA       0.83    0.91    0.90
ITA       0.89    0.90    0.87   18.97
NLD       0.83    0.83    0.89    0.82    4.09
USA       0.83    0.89    0.87    0.87    0.90    1.00
DEA       0.92    0.92    0.88    0.93    0.78    0.84   11.50
SVN       0.83    0.80    0.67    0.80    0.67    0.71    0.83   23.45
GBR       0.80    0.79    0.86    0.87    0.91    0.93    0.74    0.65    2.85
```

```
--------------------------------------------------------------------------------
BSW    ude
--------------------------------------------------------------------------------
        CAN     CHE     FRA     ITA     NLD     USA     DEA     SVN     GBR
CAN     6.54
CHE     0.96    12.04
FRA     0.95    0.95    0.97
ITA     0.94    0.96    0.95    20.60
NLD     0.96    0.94    0.95    0.93    4.01
USA     0.96    0.95    0.96    0.95    0.95    1.24
DEA     0.92    0.97    0.93    0.97    0.93    0.93    12.05
SVN     0.94    0.96    0.91    0.96    0.94    0.92    0.96    21.44
GBR     0.96    0.94    0.96    0.94    0.96    0.96    0.91    0.91    1.94


--------------------------------------------------------------------------------
BSW    ftp
--------------------------------------------------------------------------------
        CAN     CHE     FRA     NLD     USA     DEA     SVN     GBR     ITA
CAN     7.37
CHE     0.97    13.96
FRA     0.97    0.95    0.93
NLD     0.96    0.95    0.95    5.05
USA     0.92    0.91    0.88    0.91    1.32
DEA     0.95    0.98    0.95    0.96    0.90    11.09
SVN     0.94    0.93    0.92    0.93    0.90    0.92    17.78
GBR     0.95    0.93    0.89    0.94    0.95    0.91    0.93    1.38
ITA     0.87    0.86    0.86    0.86    0.88    0.86    0.86    0.87    21.91


--------------------------------------------------------------------------------
BSW    ftl
--------------------------------------------------------------------------------
        CAN     CHE     FRA     ITA     NLD     USA     DEA     SVN     GBR
CAN     6.46
CHE     0.90    14.68
FRA     0.95    0.95    0.95
ITA     0.93    0.94    0.95    18.49
NLD     0.92    0.96    0.92    0.92    4.97
USA     0.93    0.96    0.95    0.93    0.96    1.76
DEA     0.90    0.98    0.97    0.96    0.94    0.96    11.12
SVN     0.90    0.93    0.90    0.93    0.94    0.91    0.93    17.97
GBR     0.95    0.94    0.93    0.94    0.97    0.96    0.93    0.93    1.40


--------------------------------------------------------------------------------
BSW    rtp
--------------------------------------------------------------------------------
        CAN     CHE     FRA     ITA     NLD     DEA     SVN     USA
CAN     6.61
CHE     0.97    14.52
FRA     0.97    0.97    0.92
ITA     0.92    0.95    0.93    20.91
NLD     0.97    0.96    0.97    0.92    4.61
DEA     0.96    0.99    0.97    0.96    0.94    12.02
SVN     0.94    0.93    0.92    0.93    0.95    0.93    17.33
USA     0.92    0.88    0.91    0.89    0.94    0.88    0.89    1.32


--------------------------------------------------------------------------------
BSW    ocs
--------------------------------------------------------------------------------
        CAN     CHE     FRA     ITA     NLD     USA     DEA     SVN     GBR
CAN     7.52
CHE     0.83    9.27
FRA     0.76    0.85    0.95
ITA     0.79    0.81    0.89    9.24
NLD     0.73    0.73    0.79    0.72    3.54
USA     0.83    0.77    0.84    0.82    0.81    0.53
DEA     0.81    0.91    0.90    0.88    0.66    0.75    10.64
SVN     0.67    0.68    0.75    0.71    0.68    0.70    0.77    20.79
GBR     0.79    0.86    0.86    0.80    0.86    0.88    0.72    0.71    1.73
```

```
--------------------------------------------------------------------------------
BSW    ous
--------------------------------------------------------------------------------
         CAN     CHE     FRA     ITA     NLD     USA     DEA     SVN     GBR
CAN      8.01
CHE      0.88   13.80
FRA      0.88    0.91    0.93
ITA      0.81    0.88    0.90   10.46
NLD      0.88    0.87    0.91    0.79    4.47
USA      0.84    0.88    0.84    0.83    0.84    0.99
DEA      0.87    0.95    0.91    0.91    0.85    0.89   12.41
SVN      0.74    0.85    0.78    0.81    0.77    0.82    0.92   19.89
GBR      0.80    0.84    0.75    0.81    0.76    0.86    0.76    0.73    1.44

--------------------------------------------------------------------------------
BSW    ofl
--------------------------------------------------------------------------------
         CAN     CHE     FRA     ITA     NLD     USA     DEA     SVN     GBR
CAN      8.31
CHE      0.84   11.60
FRA      0.65    0.66    1.24
ITA      0.65    0.70    0.85   17.75
NLD      0.66    0.65    0.73    0.64    4.17
USA      0.68    0.64    0.78    0.74    0.65    1.04
DEA      0.69    0.85    0.68    0.81    0.60    0.61   11.32
SVN      0.76    0.86    0.69    0.76    0.66    0.70    0.90   28.04
GBR      0.70    0.76    0.82    0.67    0.73    0.72    0.67    0.64    1.68

--------------------------------------------------------------------------------
BSW    ofr
--------------------------------------------------------------------------------
         CAN     CHE     DEA     ITA     SVN     USA     FRA
CAN      6.95
CHE      0.82   12.13
DEA      0.83    0.90   11.58
ITA      0.81    0.91    0.95   17.49
SVN      0.77    0.80    0.79    0.85   21.83
USA      0.79    0.84    0.91    0.86    0.78    1.63
FRA      0.78    0.87    0.93    0.91    0.83    0.90    0.90

--------------------------------------------------------------------------------
BSW    tpl
--------------------------------------------------------------------------------
         CAN     CHE     DEA     ITA     SVN     FRA
CAN      6.65
CHE      0.89   12.05
DEA      0.91    0.91   11.72
ITA      0.92    0.92    0.94   24.02
SVN      0.89    0.89    0.88    0.87   23.08
FRA      0.97    0.93    0.90    0.91    0.88    1.27

--------------------------------------------------------------------------------
BSW    oru
--------------------------------------------------------------------------------
         CAN     CHE     DEA     ITA     SVN     USA     FRA
CAN      6.98
CHE      0.75   16.16
DEA      0.70    0.86   12.60
ITA      0.91    0.75    0.75   17.74
SVN      0.84    0.58    0.65    0.74   27.20
USA      0.89    0.57    0.48    0.83    0.69    0.97
FRA      0.90    0.88    0.85    0.89    0.73    0.85    1.11

--------------------------------------------------------------------------------
BSW    rle
--------------------------------------------------------------------------------
         CHE     DEA     ITA     SVN     USA     FRA
CHE     11.77
```

```
DEA       0.96    12.37
ITA       0.83     0.86    19.88
SVN       0.81     0.82     0.83    26.18
USA       0.54     0.51     0.77     0.70     0.97
FRA       0.92     0.93     0.89     0.81     0.74     1.02


--------------------------------------------------------------------------------
BSW    thp
--------------------------------------------------------------------------------
          CAN      CHE      DEA      ITA      SVN      USA      FRA
CAN       7.73
CHE       0.82    11.30
DEA       0.76     0.84    12.17
ITA       0.88     0.90     0.84    30.28
SVN       0.80     0.84     0.85     0.89    36.10
USA       0.87     0.88     0.71     0.83     0.71     1.36
FRA       0.90     0.84     0.87     0.85     0.83     0.80     1.02


--------------------------------------------------------------------------------
BSW    hoq
--------------------------------------------------------------------------------
          CAN      CHE      DEA      ITA      SVN      FRA
CAN       7.09
CHE       0.92    12.02
DEA       0.91     0.89    12.56
ITA       0.91     0.83     0.86    19.94
SVN       0.95     0.89     0.92     0.90    21.74
FRA       0.91     0.84     0.89     0.88     0.92     1.03


--------------------------------------------------------------------------------
BSW    ful
--------------------------------------------------------------------------------
          CHE      DEA      ITA      SVN      FRA
CHE      11.73
DEA       0.91    12.34
ITA       0.92     0.95    12.89
SVN       0.79     0.88     0.85    20.85
FRA       0.71     0.82     0.75     0.75     0.94


--------------------------------------------------------------------------------
BSW    udb
--------------------------------------------------------------------------------
          CHE      DEA      ITA      SVN      FRA
CHE      11.92
DEA       0.97    13.25
ITA       0.93     0.96    26.61
SVN       0.82     0.86     0.82    25.90
FRA       0.91     0.87     0.85     0.79     0.95


--------------------------------------------------------------------------------
BSW    tdi
--------------------------------------------------------------------------------
          CHE      DEA      ITA      SVN      FRA
CHE      15.81
DEA       0.96    11.38
ITA       0.94     0.95    20.94
SVN       0.91     0.93     0.93    17.69
FRA       0.96     0.97     0.91     0.91     0.91


--------------------------------------------------------------------------------
BSW    tth
--------------------------------------------------------------------------------
          CHE      DEA      ITA      SVN      FRA
CHE      14.43
DEA       0.98    13.00
ITA       0.94     0.94    23.16
SVN       0.88     0.90     0.88    19.98
FRA       0.93     0.93     0.95     0.88     0.87
```

```
--------------------------------------------------------------------------------
GUE    sta
--------------------------------------------------------------------------------
            CAN      GBR      USA      AUS
CAN       6.38
GBR       0.97     1.21
USA       0.98     0.96     2.80
AUS       0.90     0.93     0.91     0.84

--------------------------------------------------------------------------------
GUE    cwi
--------------------------------------------------------------------------------
            CAN      GBR      USA      AUS
CAN       6.75
GBR       0.92     1.72
USA       0.86     0.85     1.55
AUS       0.72     0.80     0.66     0.34

--------------------------------------------------------------------------------
GUE    bde
--------------------------------------------------------------------------------
            CAN      GBR      USA      AUS
CAN       6.20
GBR       0.87     1.51
USA       0.75     0.89     1.79
AUS       0.80     0.77     0.70     0.45

--------------------------------------------------------------------------------
GUE    ang
--------------------------------------------------------------------------------
            CAN      GBR      USA      AUS
CAN       7.80
GBR       0.89     1.76
USA       0.88     0.91     1.91
AUS       0.65     0.76     0.68     0.39

--------------------------------------------------------------------------------
GUE    ran
--------------------------------------------------------------------------------
            CAN      GBR      USA      AUS
CAN       6.38
GBR       0.97     1.61
USA       0.97     0.97     2.01
AUS       0.91     0.93     0.90     0.76

--------------------------------------------------------------------------------
GUE    rwi
--------------------------------------------------------------------------------
            CAN      GBR      USA      AUS
CAN       6.87
GBR       0.93     1.48
USA       0.92     0.92     1.73
AUS       0.86     0.85     0.79     0.64

--------------------------------------------------------------------------------
GUE    rls
--------------------------------------------------------------------------------
            CAN      GBR      USA      AUS
CAN       8.35
GBR       0.82     1.82
USA       0.93     0.80     0.91
AUS       0.71     0.80     0.71     0.32

--------------------------------------------------------------------------------
GUE    rlr
--------------------------------------------------------------------------------
            CAN      USA      AUS
CAN       7.21
USA       0.85     0.91
```

```
AUS        0.62    0.54    0.19

-----------------------------------------------------------------------------------------
GUE    fan
-----------------------------------------------------------------------------------------
           CAN     GBR     USA     AUS
CAN        8.14
GBR        0.80    1.71
USA        0.84    0.76    0.88
AUS        0.63    0.77    0.66    0.26

-----------------------------------------------------------------------------------------
GUE    fua
-----------------------------------------------------------------------------------------
           CAN     GBR     USA     AUS
CAN        7.27
GBR        0.94    1.68
USA        0.92    0.91    1.84
AUS        0.80    0.78    0.77    0.38

-----------------------------------------------------------------------------------------
GUE    ruh
-----------------------------------------------------------------------------------------
           CAN     GBR     USA     AUS
CAN        6.88
GBR        0.74    2.10
USA        0.80    0.90    1.49
AUS        0.77    0.77    0.76    0.36

-----------------------------------------------------------------------------------------
GUE    usu
-----------------------------------------------------------------------------------------
           CAN     GBR     USA     AUS
CAN        6.70
GBR        0.80    1.78
USA        0.80    0.87    1.36
AUS        0.77    0.78    0.76    0.29

-----------------------------------------------------------------------------------------
GUE    ude
-----------------------------------------------------------------------------------------
           CAN     GBR     USA     AUS
CAN        6.02
GBR        0.97    1.59
USA        0.95    0.95    1.86
AUS        0.89    0.90    0.89    0.53

-----------------------------------------------------------------------------------------
GUE    ftp
-----------------------------------------------------------------------------------------
           CAN     GBR     USA     AUS
CAN        5.83
GBR        0.96    1.31
USA        0.92    0.92    1.62
AUS        0.92    0.92    0.87    0.40

-----------------------------------------------------------------------------------------
GUE    ftl
-----------------------------------------------------------------------------------------
           CAN     GBR     USA     AUS
CAN        4.64
GBR        0.95    1.93
USA        0.94    0.97    2.04
AUS        0.93    0.94    0.93    0.95

-----------------------------------------------------------------------------------------
GUE    rtp
-----------------------------------------------------------------------------------------
           CAN     AUS     USA
```

```
CAN       5.45
AUS       0.89     0.35
USA       0.93     0.89     1.62


--------------------------------------------------------------------------------
GUE    ocs
--------------------------------------------------------------------------------
          CAN      GBR      USA      AUS
CAN       8.18
GBR       0.81     2.16
USA       0.77     0.86     0.90
AUS       0.58     0.64     0.58     0.82


--------------------------------------------------------------------------------
GUE    ous
--------------------------------------------------------------------------------
          CAN      GBR      USA      AUS
CAN       7.92
GBR       0.80     1.60
USA       0.88     0.83     0.86
AUS       0.69     0.81     0.72     1.07


--------------------------------------------------------------------------------
GUE    ofl
--------------------------------------------------------------------------------
          CAN      GBR      USA      AUS
CAN       7.54
GBR       0.71     1.42
USA       0.75     0.69     0.98
AUS       0.43     0.53     0.48     0.60


--------------------------------------------------------------------------------
HOL    sta
--------------------------------------------------------------------------------
```

	AUS	BEL	CAN	CHE	DEU	DFS	ESP	FRA	GBR	ITA	NLD	USA	HUN	POL	NZL	ZAF	JPN	CZE	EST	IRL	KOR	SVN	PRT	LVA
AUS	0.64																							
BEL	0.89	1.08																						
CAN	0.89	0.95	5.42																					
CHE	0.89	0.92	0.96	10.75																				
DEU	0.89	0.93	0.98	0.97	12.88																			
DFS	0.87	0.95	0.97	0.96	0.97	10.73																		
ESP	0.89	0.94	0.98	0.96	0.98	0.97	0.82																	
FRA	0.90	0.96	0.98	0.97	0.97	0.97	0.98	1.06																
GBR	0.93	0.93	0.97	0.95	0.96	0.94	0.96	0.97	1.10															
ITA	0.88	0.89	0.95	0.93	0.94	0.94	0.95	0.95	0.95	1.09														
NLD	0.87	0.93	0.96	0.97	0.98	0.97	0.97	0.97	0.94	0.92	4.14													
USA	0.90	0.92	0.98	0.94	0.96	0.94	0.96	0.96	0.97	0.94	0.93	1.20												
HUN	0.89	0.92	0.96	0.93	0.96	0.93	0.96	0.97	0.95	0.93	0.93	0.94	0.91											
POL	0.85	0.87	0.92	0.90	0.93	0.91	0.93	0.92	0.90	0.90	0.91	0.90	0.92	9.92										
NZL	0.88	0.86	0.84	0.84	0.83	0.83	0.83	0.87	0.89	0.83	0.83	0.86	0.84	0.83	0.43									
ZAF	0.91	0.91	0.91	0.89	0.90	0.87	0.89	0.91	0.93	0.86	0.86	0.91	0.89	0.86	0.89	0.73								
JPN	0.89	0.95	0.98	0.97	0.97	0.97	0.98	0.98	0.96	0.95	0.96	0.97	0.95	0.92	0.86	0.91	1.20							
CZE	0.89	0.94	0.97	0.94	0.97	0.95	0.96	0.96	0.95	0.92	0.95	0.95	0.96	0.92	0.84	0.92	0.96	13.10						
EST	0.87	0.91	0.94	0.93	0.95	0.95	0.93	0.95	0.92	0.93	0.96	0.90	0.93	0.91	0.84	0.87	0.94	0.95	14.95					
IRL	0.89	0.88	0.92	0.91	0.91	0.88	0.92	0.93	0.97	0.91	0.89	0.93	0.91	0.86	0.87	0.90	0.91	0.93	0.88	0.71				
KOR	0.84	0.85	0.85	0.84	0.85	0.84	0.84	0.86	0.86	0.84	0.84	0.84	0.85	0.84	0.83	0.84	0.85	0.86	0.86	0.84	4.51			
SVN	0.88	0.92	0.94	0.95	0.96	0.95	0.96	0.94	0.92	0.91	0.96	0.93	0.91	0.93	0.84	0.85	0.95	0.93	0.93	0.88	0.85	14.40		
PRT	0.87	0.90	0.94	0.91	0.95	0.93	0.94	0.94	0.94	0.91	0.91	0.92	0.93	0.89	0.83	0.87	0.94	0.94	0.91	0.90	0.84	0.90	1.21	
LVA	0.84	0.83	0.83	0.84	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.84	0.84	0.83	0.83	0.84	0.84	0.83	0.84	0.83	0.43

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--------------------------------------------------------------------------------
HOL    cwi
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	AUS	BEL	CAN	CHE	DEU	DFS	ESP	FRA	GBR	ITA	NLD	USA	HUN	POL	NZL	ZAF	JPN	CZE	EST	IRL	KOR	SVN	PRT	LVA
AUS	0.41																							
BEL	0.66	1.71																						
CAN	0.73	0.85	6.40																					
CHE	0.65	0.85	0.89	11.10																				
DEU	0.69	0.87	0.90	0.84	12.44																			

```
DFS    0.71   0.87   0.92   0.84   0.94  12.67
ESP    0.67   0.88   0.92   0.87   0.82   0.85   1.05
FRA    0.64   0.91   0.85   0.92   0.86   0.83   0.86   1.14
GBR    0.81   0.85   0.92   0.85   0.90   0.89   0.85   0.82   1.41
ITA    0.64   0.79   0.76   0.81   0.69   0.66   0.81   0.88   0.70   1.24
NLD    0.72   0.87   0.92   0.87   0.94   0.91   0.85   0.86   0.91   0.70   5.03
USA    0.64   0.83   0.85   0.88   0.81   0.80   0.85   0.92   0.80   0.91   0.81   1.26
HUN    0.64   0.83   0.86   0.83   0.84   0.83   0.83   0.89   0.78   0.81   0.81   0.88   1.14
POL    0.65   0.89   0.87   0.83   0.85   0.85   0.87   0.85   0.83   0.78   0.84   0.82   0.83  12.37
NZL    0.78   0.64   0.71   0.65   0.70   0.71   0.71   0.65   0.80   0.63   0.68   0.68   0.63   0.64   0.38
ZAF    0.66   0.89   0.83   0.86   0.85   0.85   0.86   0.88   0.89   0.75   0.85   0.87   0.83   0.83   0.69   0.83
JPN    0.64   0.83   0.75   0.83   0.71   0.71   0.81   0.91   0.67   0.92   0.71   0.91   0.83   0.75   0.63   0.77   1.53
CZE    0.71   0.90   0.92   0.85   0.91   0.91   0.91   0.85   0.88   0.77   0.89   0.84   0.87   0.89   0.70   0.87   0.77  14.17
EST    0.72   0.77   0.83   0.75   0.76   0.83   0.81   0.70   0.79   0.64   0.82   0.65   0.65   0.71   0.66   0.70   0.64   0.77  23.45
IRL    0.78   0.77   0.83   0.78   0.85   0.81   0.73   0.76   0.93   0.65   0.83   0.73   0.73   0.74   0.82   0.82   0.64   0.82   0.72   1.34
KOR    0.64   0.73   0.64   0.64   0.72   0.71   0.70   0.72   0.66   0.66   0.65   0.71   0.72   0.64   0.67   0.67   0.70   0.75   0.64   0.64   2.60
SVN    0.64   0.78   0.82   0.80   0.85   0.85   0.82   0.78   0.79   0.67   0.85   0.79   0.84   0.79   0.64   0.84   0.68   0.81   0.72   0.73   0.65  20.81
PRT    0.65   0.82   0.81   0.79   0.86   0.83   0.81   0.83   0.80   0.74   0.84   0.83   0.86   0.84   0.63   0.78   0.76   0.85   0.65   0.74   0.69   0.75   2.07
LVA    0.63   0.73   0.68   0.75   0.68   0.72   0.63   0.71   0.64   0.63   0.70   0.66   0.64   0.68   0.63   0.64   0.65   0.69   0.71   0.63   0.64   0.70   0.67   0.36

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HOL    bde
------------------------------------------------------------------------------------
       AUS    BEL    CAN    CHE    DEU    DFS    ESP    FRA    GBR    ITA    NLD    USA    HUN    POL    NZL    ZAF    JPN    CZE    EST    IRL    KOR    PRT    SVN    LVA
AUS    0.54
BEL    0.69   1.42
CAN    0.83   0.77   5.53
CHE    0.71   0.91   0.87  11.28
DEU    0.75   0.91   0.88   0.91  11.71
DFS    0.81   0.85   0.92   0.87   0.94  11.75
ESP    0.75   0.90   0.89   0.92   0.91   0.89   0.98
FRA    0.69   0.92   0.68   0.87   0.83   0.74   0.84   1.07
GBR    0.78   0.90   0.87   0.91   0.92   0.90   0.93   0.81   1.33
ITA    0.69   0.88   0.70   0.85   0.85   0.77   0.86   0.90   0.86   1.20
NLD    0.69   0.88   0.83   0.92   0.91   0.85   0.91   0.86   0.91   0.88   4.76
USA    0.69   0.92   0.74   0.89   0.89   0.80   0.89   0.92   0.87   0.92   0.90   1.15
HUN    0.69   0.90   0.81   0.88   0.89   0.86   0.91   0.83   0.89   0.84   0.84   0.89   1.05
POL    0.76   0.82   0.85   0.83   0.92   0.90   0.87   0.71   0.87   0.80   0.83   0.81   0.87  12.48
NZL    0.77   0.68   0.68   0.68   0.68   0.69   0.68   0.68   0.68   0.68   0.68   0.68   0.68   0.71   0.38
ZAF    0.73   0.87   0.83   0.83   0.87   0.87   0.88   0.75   0.91   0.76   0.82   0.85   0.84   0.86   0.68   0.87
JPN    0.69   0.94   0.74   0.90   0.90   0.82   0.89   0.95   0.86   0.90   0.90   0.94   0.88   0.79   0.68   0.79   1.37
CZE    0.81   0.82   0.93   0.84   0.93   0.92   0.88   0.69   0.89   0.76   0.83   0.80   0.88   0.92   0.69   0.86   0.78  15.42
EST    0.76   0.81   0.91   0.86   0.89   0.89   0.89   0.74   0.87   0.75   0.85   0.81   0.84   0.86   0.64   0.78   0.81   0.89  18.89
IRL    0.80   0.85   0.84   0.88   0.89   0.89   0.87   0.75   0.94   0.82   0.86   0.83   0.82   0.84   0.73   0.87   0.80   0.86   0.79   1.17
KOR    0.68   0.80   0.70   0.79   0.83   0.82   0.78   0.76   0.75   0.69   0.71   0.74   0.78   0.72   0.67   0.74   0.80   0.77   0.72   0.73   3.34
PRT    0.76   0.80   0.80   0.78   0.89   0.86   0.83   0.69   0.85   0.77   0.78   0.79   0.85   0.87   0.71   0.82   0.80   0.87   0.77   0.84   0.71   1.99
SVN    0.74   0.88   0.84   0.88   0.90   0.87   0.91   0.83   0.88   0.83   0.92   0.86   0.86   0.85   0.66   0.78   0.86   0.84   0.85   0.84   0.75   0.75  20.54
LVA    0.72   0.71   0.78   0.76   0.79   0.81   0.72   0.67   0.77   0.68   0.69   0.68   0.79   0.78   0.67   0.69   0.68   0.84   0.71   0.76   0.76   0.78   0.68   0.33

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HOL    ang
------------------------------------------------------------------------------------
       AUS    BEL    CAN    CHE    DEU    DFS    ESP    FRA    GBR    ITA    NLD    USA    HUN    POL    ZAF    JPN    CZE    EST    IRL    KOR    PRT    SVN    LVA
AUS    0.43
BEL    0.60   1.15
CAN    0.65   0.75   6.64
CHE    0.60   0.76   0.88  11.41
DEU    0.62   0.70   0.80   0.74  12.73
DFS    0.67   0.85   0.89   0.81   0.81  10.45
ESP    0.64   0.76   0.87   0.78   0.71   0.84   0.72
FRA    0.62   0.84   0.88   0.86   0.75   0.87   0.82   0.93
GBR    0.77   0.75   0.91   0.80   0.76   0.87   0.81   0.81   1.50
ITA    0.66   0.73   0.90   0.79   0.75   0.84   0.86   0.81   0.85   1.27
NLD    0.71   0.61   0.82   0.75   0.61   0.72   0.78   0.68   0.83   0.78   4.46
USA    0.67   0.75   0.93   0.81   0.83   0.90   0.84   0.84   0.90   0.84   0.74   1.38
HUN    0.60   0.71   0.76   0.71   0.80   0.78   0.70   0.81   0.71   0.74   0.60   0.79   1.02
POL    0.60   0.67   0.70   0.67   0.62   0.73   0.77   0.71   0.66   0.80   0.64   0.68   0.60  10.16
ZAF    0.63   0.81   0.71   0.68   0.73   0.79   0.69   0.74   0.85   0.74   0.61   0.76   0.78   0.62   0.72
JPN    0.65   0.80   0.90   0.81   0.79   0.91   0.87   0.85   0.86   0.91   0.78   0.88   0.77   0.77   0.77   1.43
```

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CZE    0.66   0.77   0.82   0.75   0.73   0.85   0.74   0.76   0.75   0.78   0.64   0.77   0.81   0.64   0.68   0.80  14.11
EST    0.63   0.78   0.62   0.64   0.67   0.79   0.62   0.67   0.64   0.62   0.61   0.61   0.76   0.63   0.74   0.69   0.72  24.67
IRL    0.72   0.72   0.86   0.76   0.77   0.82   0.80   0.81   0.92   0.82   0.73   0.88   0.73   0.64   0.81   0.85   0.76   0.62   0.73
KOR    0.69   0.77   0.78   0.72   0.71   0.74   0.76   0.74   0.79   0.74   0.65   0.77   0.76   0.64   0.76   0.84   0.70   0.70   0.75   2.26
PRT    0.60   0.69   0.77   0.64   0.76   0.79   0.74   0.73   0.78   0.77   0.60   0.80   0.71   0.65   0.70   0.81   0.72   0.62   0.75   0.77   1.21
SVN    0.69   0.64   0.72   0.72   0.61   0.66   0.69   0.66   0.70   0.74   0.69   0.64   0.61   0.83   0.64   0.69   0.63   0.71   0.63   0.74   0.63  20.82
LVA    0.61   0.61   0.61   0.61   0.60   0.61   0.60   0.61   0.61   0.61   0.61   0.60   0.61   0.61   0.62   0.61   0.61   0.63   0.61   0.61   0.61   0.62   0.31
```

HOL   ran

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       AUS    BEL    CAN    CHE    DEU    DFS    ESP    FRA    GBR    ITA    NLD    USA    HUN    POL    NZL    ZAF    JPN    CZE    EST    IRL    KOR    SVN    PRT    LVA
AUS    0.63
BEL    0.94   1.47
CAN    0.91   0.97   6.08
CHE    0.92   0.96   0.96  11.39
DEU    0.92   0.97   0.98   0.95  12.21
DFS    0.92   0.98   0.98   0.96   0.98  11.60
ESP    0.91   0.97   0.97   0.97   0.97   0.96   1.15
FRA    0.95   0.98   0.97   0.97   0.97   0.96   0.97   1.07
GBR    0.94   0.96   0.97   0.95   0.97   0.95   0.96   0.98   1.41
ITA    0.88   0.95   0.95   0.93   0.96   0.94   0.95   0.95   0.94   1.46
NLD    0.91   0.96   0.97   0.95   0.98   0.96   0.97   0.96   0.97   0.94   5.06
USA    0.90   0.95   0.97   0.95   0.97   0.96   0.96   0.96   0.97   0.94   0.96   1.46
HUN    0.91   0.97   0.95   0.95   0.97   0.96   0.97   0.97   0.95   0.95   0.95   0.94   1.05
POL    0.89   0.95   0.96   0.94   0.96   0.96   0.96   0.94   0.94   0.94   0.95   0.92   0.95  11.26
NZL    0.94   0.89   0.88   0.89   0.89   0.87   0.87   0.93   0.93   0.87   0.88   0.89   0.88   0.87   0.34
ZAF    0.95   0.95   0.92   0.92   0.92   0.92   0.93   0.94   0.94   0.88   0.93   0.92   0.94   0.89   0.89   0.88
JPN    0.88   0.95   0.97   0.96   0.96   0.97   0.96   0.94   0.92   0.93   0.94   0.94   0.95   0.95   0.86   0.89   1.45
CZE    0.88   0.95   0.96   0.92   0.97   0.95   0.95   0.94   0.96   0.94   0.96   0.96   0.95   0.94   0.87   0.90   0.93  14.61
EST    0.88   0.92   0.93   0.90   0.95   0.93   0.92   0.92   0.92   0.92   0.96   0.93   0.90   0.93   0.84   0.88   0.92   0.93  18.88
IRL    0.93   0.92   0.92   0.93   0.94   0.91   0.92   0.95   0.98   0.92   0.94   0.94   0.91   0.89   0.94   0.90   0.88   0.91   0.89   1.76
KOR    0.88   0.89   0.88   0.89   0.88   0.88   0.90   0.89   0.88   0.88   0.88   0.88   0.89   0.88   0.87   0.88   0.90   0.88   0.87   0.88   4.83
SVN    0.90   0.96   0.95   0.93   0.95   0.96   0.94   0.95   0.93   0.93   0.94   0.93   0.92   0.94   0.88   0.88   0.95   0.91   0.90   0.90   0.88  17.60
PRT    0.88   0.92   0.92   0.91   0.95   0.92   0.94   0.93   0.94   0.92   0.93   0.93   0.93   0.92   0.88   0.88   0.90   0.93   0.89   0.90   0.88   0.93   1.78
LVA    0.87   0.93   0.94   0.92   0.94   0.94   0.93   0.92   0.91   0.92   0.93   0.91   0.93   0.93   0.86   0.87   0.95   0.91   0.90   0.89   0.89   0.91   0.89   0.46
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HOL   rwi

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       AUS    BEL    CAN    CHE    DEU    DFS    ESP    FRA    GBR    ITA    NLD    USA    HUN    POL    NZL    ZAF    JPN    CZE    EST    IRL    KOR    PRT    SVN    LVA
AUS    0.53
BEL    0.84   1.46
CAN    0.88   0.95   5.76
CHE    0.86   0.95   0.93  11.15
DEU    0.82   0.93   0.95   0.90  11.43
DFS    0.81   0.92   0.94   0.89   0.97  12.41
ESP    0.89   0.93   0.97   0.91   0.95   0.94   0.99
FRA    0.87   0.97   0.97   0.93   0.95   0.95   0.95   1.10
GBR    0.85   0.91   0.94   0.87   0.90   0.91   0.92   0.94   1.32
ITA    0.78   0.84   0.88   0.81   0.84   0.84   0.88   0.89   0.90   1.30
NLD    0.85   0.95   0.94   0.93   0.96   0.93   0.94   0.95   0.89   0.80   4.80
USA    0.78   0.85   0.91   0.80   0.85   0.87   0.88   0.89   0.94   0.89   0.81   1.28
HUN    0.79   0.91   0.92   0.85   0.93   0.91   0.89   0.93   0.90   0.89   0.90   0.88   1.02
POL    0.82   0.91   0.92   0.89   0.90   0.90   0.90   0.91   0.88   0.86   0.88   0.82   0.91  11.24
NZL    0.84   0.85   0.87   0.80   0.82   0.80   0.86   0.85   0.87   0.79   0.83   0.82   0.81   0.76   0.31
ZAF    0.78   0.82   0.85   0.78   0.84   0.84   0.80   0.83   0.91   0.80   0.79   0.87   0.85   0.80   0.79   0.89
JPN    0.83   0.95   0.96   0.94   0.94   0.94   0.94   0.97   0.93   0.90   0.93   0.90   0.93   0.92   0.84   0.85   1.32
CZE    0.82   0.92   0.94   0.88   0.95   0.93   0.95   0.92   0.90   0.86   0.93   0.87   0.92   0.91   0.84   0.82   0.93  14.92
EST    0.80   0.90   0.90   0.90   0.92   0.88   0.89   0.89   0.85   0.83   0.92   0.78   0.88   0.91   0.80   0.80   0.89   0.91  17.34
IRL    0.78   0.78   0.80   0.78   0.79   0.79   0.78   0.79   0.88   0.78   0.78   0.85   0.79   0.78   0.79   0.79   0.79   0.79   0.79   1.57
KOR    0.78   0.83   0.81   0.80   0.80   0.79   0.79   0.83   0.78   0.78   0.79   0.78   0.82   0.78   0.77   0.78   0.82   0.79   0.79   0.78   3.31
PRT    0.78   0.86   0.88   0.80   0.89   0.89   0.87   0.87   0.85   0.84   0.81   0.85   0.88   0.84   0.76   0.83   0.87   0.86   0.78   0.77   0.77   1.71
SVN    0.81   0.91   0.93   0.91   0.93   0.93   0.93   0.91   0.89   0.81   0.93   0.85   0.88   0.91   0.78   0.82   0.92   0.92   0.89   0.79   0.80   0.83  21.34
LVA    0.77   0.81   0.79   0.77   0.82   0.85   0.79   0.80   0.77   0.76   0.79   0.76   0.80   0.79   0.77   0.77   0.79   0.82   0.80   0.76   0.77   0.76   0.81   0.43
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HOL   rls

	AUS	BEL	CAN	CHE	DEU	DFS	ESP	FRA	GBR	ITA	NLD	USA	HUN	POL	NZL	ZAF	JPN	CZE	EST	IRL	KOR	SVN	PRT	LVA
AUS	0.31																							
BEL	0.78	1.82																						
CAN	0.71	0.95	6.23																					
CHE	0.79	0.92	0.93	11.69																				
DEU	0.73	0.94	0.95	0.92	11.94																			
DFS	0.69	0.94	0.97	0.91	0.96	13.46																		
ESP	0.74	0.95	0.95	0.92	0.96	0.95	1.19																	
FRA	0.78	0.91	0.89	0.90	0.89	0.88	0.91	1.07																
GBR	0.81	0.87	0.84	0.85	0.86	0.82	0.83	0.91	1.44															
ITA	0.68	0.89	0.89	0.85	0.90	0.90	0.90	0.89	0.82	1.50														
NLD	0.73	0.91	0.93	0.91	0.94	0.92	0.92	0.89	0.86	0.86	5.24													
USA	0.70	0.95	0.96	0.89	0.93	0.96	0.95	0.88	0.82	0.90	0.90	1.64												
HUN	0.74	0.92	0.91	0.87	0.93	0.91	0.94	0.88	0.83	0.89	0.86	0.91	1.01											
POL	0.71	0.92	0.92	0.87	0.95	0.91	0.92	0.89	0.81	0.89	0.86	0.90	0.94	12.09										
NZL	0.69	0.65	0.65	0.66	0.65	0.65	0.65	0.70	0.73	0.65	0.65	0.65	0.66	0.66	0.14									
ZAF	0.83	0.81	0.78	0.78	0.74	0.71	0.78	0.84	0.87	0.70	0.75	0.77	0.75	0.80	0.66	0.84								
JPN	0.69	0.91	0.97	0.89	0.94	0.97	0.94	0.87	0.80	0.89	0.89	0.94	0.89	0.93	0.65	0.72	1.76							
CZE	0.71	0.91	0.92	0.83	0.93	0.92	0.91	0.87	0.85	0.87	0.88	0.91	0.92	0.94	0.65	0.77	0.91	15.38						
EST	0.71	0.86	0.85	0.84	0.90	0.88	0.88	0.84	0.73	0.84	0.89	0.85	0.85	0.88	0.66	0.69	0.86	0.82	20.91					
IRL	0.79	0.77	0.71	0.78	0.74	0.70	0.72	0.81	0.90	0.72	0.76	0.71	0.72	0.72	0.70	0.79	0.70	0.73	0.69	1.56				
KOR	0.68	0.81	0.85	0.81	0.83	0.86	0.87	0.81	0.73	0.79	0.82	0.84	0.85	0.81	0.66	0.68	0.86	0.80	0.75	0.68	2.29			
SVN	0.69	0.90	0.95	0.90	0.93	0.95	0.90	0.89	0.81	0.89	0.91	0.91	0.90	0.88	0.67	0.69	0.92	0.86	0.86	0.70	0.83	22.48		
PRT	0.68	0.86	0.83	0.78	0.84	0.85	0.86	0.83	0.77	0.84	0.81	0.85	0.85	0.81	0.65	0.67	0.82	0.81	0.72	0.67	0.80	0.83	2.35	
LVA	0.66	0.75	0.80	0.83	0.82	0.80	0.79	0.80	0.74	0.74	0.83	0.77	0.80	0.80	0.66	0.66	0.79	0.80	0.76	0.66	0.79	0.78	0.73	0.30

HOL   rlr

	AUS	BEL	CAN	CHE	DEU	DFS	ESP	FRA	GBR	ITA	NLD	USA	HUN	POL	ZAF	JPN	CZE	EST	IRL	KOR	SVN	PRT	LVA
AUS	0.25																						
BEL	0.64	1.81																					
CAN	0.58	0.85	6.77																				
CHE	0.70	0.85	0.75	12.32																			
DEU	0.61	0.92	0.89	0.75	11.36																		
DFS	0.57	0.88	0.90	0.74	0.93	13.25																	
ESP	0.59	0.87	0.88	0.72	0.87	0.89	1.11																
FRA	0.70	0.92	0.85	0.86	0.85	0.83	0.87	1.08															
GBR	0.51	0.65	0.69	0.56	0.65	0.61	0.69	0.64	1.51														
ITA	0.57	0.79	0.81	0.66	0.77	0.74	0.80	0.82	0.68	1.85													
NLD	0.57	0.89	0.87	0.71	0.91	0.91	0.84	0.83	0.65	0.75	4.07												
USA	0.53	0.78	0.87	0.62	0.77	0.83	0.79	0.78	0.67	0.87	0.81	1.78											
HUN	0.62	0.84	0.77	0.75	0.80	0.77	0.75	0.81	0.54	0.76	0.75	0.78	1.12										
POL	0.53	0.81	0.83	0.67	0.78	0.82	0.76	0.80	0.53	0.78	0.74	0.76	0.71	14.96									
ZAF	0.57	0.71	0.56	0.60	0.54	0.55	0.51	0.63	0.51	0.63	0.53	0.70	0.64	0.61	0.73								
JPN	0.59	0.82	0.88	0.76	0.84	0.92	0.80	0.81	0.51	0.69	0.82	0.77	0.75	0.76	0.55	2.01							
CZE	0.56	0.83	0.81	0.70	0.85	0.81	0.77	0.79	0.57	0.81	0.78	0.79	0.78	0.82	0.68	0.73	16.84						
EST	0.53	0.67	0.56	0.55	0.73	0.76	0.58	0.58	0.52	0.51	0.71	0.53	0.55	0.58	0.50	0.75	0.58	19.31					
IRL	0.51	0.53	0.56	0.51	0.51	0.51	0.59	0.55	0.72	0.66	0.54	0.53	0.51	0.52	0.51	0.51	0.52	0.53	1.64				
KOR	0.55	0.71	0.75	0.62	0.72	0.76	0.79	0.77	0.51	0.71	0.70	0.72	0.65	0.70	0.52	0.74	0.71	0.57	0.52	2.05			
SVN	0.55	0.88	0.79	0.74	0.85	0.86	0.79	0.83	0.52	0.72	0.86	0.79	0.82	0.72	0.54	0.84	0.74	0.66	0.52	0.68	25.48		
PRT	0.54	0.84	0.73	0.67	0.85	0.76	0.76	0.80	0.59	0.72	0.75	0.69	0.72	0.76	0.53	0.67	0.78	0.63	0.50	0.69	0.84	2.49	
LVA	0.55	0.75	0.73	0.70	0.75	0.80	0.72	0.70	0.55	0.73	0.72	0.72	0.69	0.79	0.50	0.73	0.75	0.62	0.49	0.70	0.72	0.75	0.27

HOL   fan

	AUS	BEL	CAN	CHE	DEU	DFS	ESP	FRA	GBR	ITA	NLD	USA	HUN	POL	ZAF	JPN	CZE	EST	IRL	KOR	SVN	PRT	LVA
AUS	0.32																						
BEL	0.68	2.09																					
CAN	0.62	0.83	7.38																				
CHE	0.66	0.84	0.80	11.97																			
DEU	0.70	0.88	0.83	0.78	12.69																		
DFS	0.62	0.91	0.87	0.79	0.87	13.23																	
ESP	0.66	0.77	0.86	0.69	0.85	0.81	1.01																
FRA	0.78	0.79	0.79	0.73	0.90	0.73	0.85	1.04															
GBR	0.76	0.80	0.82	0.72	0.92	0.77	0.85	0.92	1.44														
ITA	0.62	0.69	0.77	0.68	0.76	0.72	0.75	0.73	0.75	1.58													
NLD	0.69	0.78	0.75	0.72	0.91	0.78	0.79	0.85	0.88	0.73	5.05												

USA	0.65	0.75	0.87	0.70	0.84	0.81	0.85	0.82	0.84	0.85	0.80	1.59
HUN	0.76	0.77	0.78	0.76	0.88	0.73	0.84	0.91	0.87	0.68	0.80	0.80	1.17
POL	0.62	0.71	0.75	0.72	0.71	0.71	0.71	0.70	0.68	0.73	0.63	0.75	0.74	13.05
ZAF	0.83	0.78	0.77	0.74	0.83	0.72	0.78	0.85	0.87	0.70	0.74	0.80	0.87	0.65	0.89
JPN	0.74	0.76	0.74	0.83	0.82	0.74	0.76	0.80	0.76	0.68	0.79	0.77	0.86	0.67	0.76	2.11
CZE	0.72	0.85	0.84	0.76	0.92	0.83	0.85	0.88	0.85	0.75	0.81	0.83	0.92	0.75	0.80	0.86	15.64
EST	0.74	0.75	0.72	0.73	0.84	0.77	0.86	0.85	0.81	0.63	0.84	0.75	0.84	0.63	0.74	0.87	0.87	23.58
IRL	0.68	0.69	0.73	0.64	0.81	0.69	0.74	0.77	0.91	0.69	0.75	0.72	0.70	0.65	0.74	0.62	0.71	0.68	1.60
KOR	0.63	0.63	0.71	0.62	0.71	0.65	0.77	0.72	0.71	0.63	0.64	0.72	0.74	0.64	0.64	0.62	0.72	0.66	0.63	1.55
SVN	0.63	0.64	0.73	0.63	0.76	0.76	0.71	0.64	0.68	0.63	0.63	0.72	0.65	0.65	0.64	0.63	0.73	0.66	0.73	0.63	21.62
PRT	0.61	0.62	0.61	0.61	0.74	0.61	0.71	0.74	0.66	0.65	0.68	0.73	0.64	0.61	0.66	0.65	0.71	0.74	0.61	0.72	0.68	2.14
LVA	0.61	0.65	0.61	0.64	0.66	0.67	0.63	0.73	0.68	0.62	0.65	0.69	0.68	0.60	0.61	0.61	0.71	0.75	0.61	0.61	0.62	0.61	0.28

HOL   fua

	AUS	BEL	CAN	CHE	DEU	DFS	ESP	FRA	GBR	ITA	NLD	USA	HUN	POL	NZL	ZAF	JPN	CZE	EST	IRL	KOR	SVN	PRT	LVA
AUS	0.37
BEL	0.74	1.48
CAN	0.77	0.78	5.31
CHE	0.83	0.81	0.92	12.00
DEU	0.75	0.83	0.93	0.86	12.31
DFS	0.77	0.85	0.90	0.89	0.88	11.88
ESP	0.78	0.79	0.88	0.86	0.84	0.83	0.85
FRA	0.79	0.91	0.90	0.88	0.90	0.92	0.84	1.07
GBR	0.78	0.78	0.94	0.88	0.96	0.87	0.87	0.90	1.35
ITA	0.71	0.66	0.88	0.82	0.86	0.76	0.85	0.81	0.90	1.31
NLD	0.76	0.87	0.93	0.91	0.95	0.90	0.86	0.92	0.93	0.82	4.95
USA	0.75	0.70	0.94	0.87	0.90	0.84	0.89	0.84	0.94	0.93	0.88	1.42
HUN	0.78	0.74	0.89	0.87	0.86	0.87	0.82	0.85	0.86	0.79	0.85	0.82	1.03
POL	0.72	0.81	0.85	0.85	0.91	0.88	0.80	0.88	0.88	0.78	0.87	0.81	0.85	11.78
NZL	0.77	0.77	0.84	0.80	0.84	0.81	0.80	0.86	0.87	0.77	0.84	0.85	0.74	0.76	0.41
ZAF	0.76	0.78	0.85	0.81	0.87	0.86	0.81	0.83	0.88	0.72	0.85	0.82	0.82	0.77	0.80	0.85
JPN	0.75	0.76	0.95	0.91	0.89	0.90	0.84	0.87	0.91	0.86	0.89	0.91	0.88	0.85	0.82	0.81	1.44
CZE	0.76	0.86	0.88	0.85	0.93	0.90	0.80	0.90	0.90	0.76	0.90	0.79	0.91	0.90	0.76	0.90	0.86	14.30
EST	0.64	0.73	0.78	0.74	0.79	0.82	0.66	0.80	0.77	0.63	0.80	0.69	0.80	0.76	0.68	0.76	0.70	0.80	19.27
IRL	0.78	0.74	0.84	0.81	0.84	0.74	0.86	0.82	0.92	0.86	0.82	0.88	0.70	0.77	0.83	0.79	0.79	0.75	0.65	1.16
KOR	0.69	0.75	0.68	0.75	0.69	0.77	0.73	0.75	0.69	0.62	0.71	0.65	0.77	0.74	0.67	0.80	0.72	0.79	0.66	0.69	3.28
SVN	0.56	0.78	0.54	0.59	0.67	0.62	0.63	0.65	0.57	0.57	0.66	0.57	0.58	0.65	0.53	0.55	0.60	0.64	0.55	0.56	0.66	17.53
PRT	0.60	0.72	0.65	0.64	0.63	0.68	0.71	0.66	0.64	0.58	0.66	0.64	0.59	0.63	0.70	0.66	0.68	0.63	0.60	0.66	0.67	0.63	1.46
LVA	0.65	0.84	0.77	0.73	0.77	0.78	0.67	0.80	0.72	0.60	0.79	0.68	0.78	0.75	0.73	0.68	0.74	0.83	0.70	0.62	0.73	0.67	0.61	0.34

HOL   ruh

	AUS	BEL	CAN	CHE	DEU	DFS	ESP	FRA	GBR	ITA	NLD	USA	HUN	POL	NZL	ZAF	JPN	CZE	EST	IRL	KOR	SVN	PRT	LVA
AUS	0.41
BEL	0.83	1.25
CAN	0.78	0.91	5.40
CHE	0.82	0.91	0.93	11.17
DEU	0.81	0.89	0.88	0.88	13.09
DFS	0.77	0.91	0.86	0.91	0.95	11.61
ESP	0.82	0.86	0.83	0.85	0.91	0.91	0.80
FRA	0.77	0.89	0.85	0.88	0.90	0.93	0.89	1.07
GBR	0.78	0.83	0.74	0.81	0.85	0.89	0.87	0.88	1.36
ITA	0.72	0.75	0.71	0.73	0.82	0.85	0.88	0.83	0.85	1.27
NLD	0.75	0.83	0.75	0.83	0.92	0.92	0.90	0.87	0.88	0.83	4.36
USA	0.77	0.84	0.82	0.85	0.90	0.92	0.89	0.88	0.92	0.88	0.85	1.50
HUN	0.81	0.78	0.79	0.78	0.86	0.83	0.88	0.82	0.80	0.82	0.81	0.82	0.98
POL	0.72	0.82	0.71	0.76	0.82	0.85	0.86	0.83	0.82	0.83	0.84	0.79	0.79	10.48
NZL	0.80	0.82	0.74	0.84	0.83	0.87	0.84	0.85	0.92	0.81	0.84	0.90	0.83	0.78	0.39
ZAF	0.72	0.76	0.71	0.78	0.76	0.83	0.79	0.75	0.86	0.77	0.77	0.81	0.74	0.72	0.82	0.80
JPN	0.81	0.92	0.92	0.92	0.91	0.92	0.92	0.90	0.82	0.83	0.86	0.87	0.86	0.85	0.83	0.78	1.46
CZE	0.81	0.88	0.88	0.84	0.89	0.86	0.80	0.83	0.74	0.73	0.76	0.78	0.85	0.73	0.76	0.77	0.86	14.72
EST	0.73	0.80	0.80	0.77	0.83	0.84	0.86	0.81	0.77	0.79	0.78	0.84	0.84	0.79	0.79	0.74	0.85	0.81	17.56
IRL	0.72	0.75	0.71	0.74	0.78	0.82	0.83	0.79	0.91	0.86	0.82	0.89	0.77	0.76	0.83	0.78	0.76	0.71	0.77	1.03
KOR	0.73	0.83	0.84	0.77	0.73	0.72	0.75	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.69	0.72	0.83	0.78	0.74	0.72	3.47
SVN	0.73	0.91	0.86	0.81	0.87	0.87	0.82	0.84	0.74	0.76	0.81	0.77	0.74	0.75	0.71	0.71	0.85	0.85	0.83	0.71	0.80	15.60
PRT	0.73	0.78	0.71	0.71	0.79	0.83	0.84	0.81	0.86	0.83	0.81	0.81	0.77	0.80	0.77	0.76	0.78	0.71	0.72	0.80	0.71	0.77	1.29

| LVA | 0.70 | 0.74 | 0.71 | 0.71 | 0.78 | 0.74 | 0.74 | 0.70 | 0.72 | 0.69 | 0.74 | 0.72 | 0.69 | 0.70 | 0.70 | 0.70 | 0.74 | 0.71 | 0.70 | 0.70 | 0.70 | 0.76 | 0.69 | 0.42 |

HOL   usu

	AUS	BEL	CAN	CHE	DEU	DFS	ESP	FRA	GBR	ITA	NLD	USA	HUN	POL	NZL	ZAF	JPN	CZE	EST	IRL	KOR	SVN	PRT	LVA
AUS	0.35																							
BEL	0.64	1.51																						
CAN	0.77	0.76	5.65																					
CHE	0.76	0.88	0.91	11.93																				
DEU	0.73	0.79	0.92	0.93	11.60																			
DFS	0.70	0.86	0.80	0.90	0.82	11.60																		
ESP	0.78	0.69	0.83	0.81	0.79	0.80	0.77																	
FRA	0.74	0.86	0.78	0.86	0.75	0.91	0.82	1.07																
GBR	0.81	0.65	0.80	0.80	0.75	0.82	0.91	0.88	1.32															
ITA	0.72	0.69	0.79	0.79	0.79	0.78	0.90	0.81	0.88	1.37														
NLD	0.79	0.80	0.84	0.87	0.81	0.90	0.89	0.92	0.92	0.81	4.41													
USA	0.79	0.69	0.81	0.79	0.75	0.86	0.91	0.88	0.95	0.88	0.90	1.48												
HUN	0.71	0.90	0.81	0.91	0.84	0.90	0.77	0.90	0.77	0.78	0.85	0.79	1.01											
POL	0.67	0.75	0.82	0.84	0.89	0.79	0.75	0.71	0.69	0.75	0.76	0.71	0.83	11.37										
NZL	0.61	0.58	0.57	0.58	0.58	0.57	0.68	0.57	0.60	0.65	0.57	0.67	0.57	0.58	0.39									
ZAF	0.78	0.63	0.66	0.65	0.61	0.75	0.78	0.75	0.81	0.67	0.78	0.83	0.75	0.65	0.62	0.83								
JPN	0.61	0.95	0.72	0.84	0.73	0.85	0.62	0.88	0.65	0.66	0.78	0.68	0.88	0.71	0.57	0.61	1.63							
CZE	0.60	0.88	0.80	0.86	0.87	0.77	0.65	0.71	0.62	0.69	0.69	0.63	0.88	0.86	0.57	0.60	0.82	14.06						
EST	0.69	0.89	0.82	0.86	0.86	0.84	0.70	0.82	0.70	0.67	0.83	0.70	0.85	0.80	0.58	0.62	0.86	0.87	18.85					
IRL	0.79	0.69	0.83	0.80	0.79	0.75	0.87	0.80	0.91	0.87	0.84	0.86	0.75	0.75	0.71	0.75	0.64	0.68	0.70	1.07				
KOR	0.64	0.69	0.84	0.76	0.81	0.68	0.73	0.63	0.62	0.75	0.66	0.69	0.73	0.81	0.58	0.64	0.64	0.76	0.64	0.68	2.64			
SVN	0.62	0.76	0.84	0.80	0.87	0.71	0.64	0.63	0.60	0.61	0.65	0.61	0.71	0.82	0.58	0.57	0.70	0.85	0.83	0.68	0.68	20.09		
PRT	0.69	0.65	0.77	0.76	0.81	0.69	0.79	0.64	0.73	0.77	0.72	0.69	0.71	0.75	0.57	0.59	0.59	0.71	0.64	0.76	0.70	0.69	1.57	
LVA	0.58	0.58	0.64	0.64	0.61	0.65	0.73	0.69	0.75	0.67	0.68	0.69	0.63	0.65	0.64	0.59	0.58	0.58	0.59	0.72	0.57	0.57	0.64	0.29

HOL   ude

	AUS	BEL	CAN	CHE	DEU	DFS	ESP	FRA	GBR	ITA	NLD	USA	HUN	POL	ZAF	JPN	CZE	EST	IRL	KOR	SVN	PRT	LVA
AUS	0.58																						
BEL	0.90	1.37																					
CAN	0.89	0.96	5.25																				
CHE	0.93	0.95	0.96	11.84																			
DEU	0.90	0.96	0.97	0.96	13.18																		
DFS	0.89	0.95	0.97	0.96	0.97	11.83																	
ESP	0.90	0.97	0.98	0.96	0.97	0.97	1.05																
FRA	0.91	0.97	0.97	0.98	0.98	0.97	0.97	1.11															
GBR	0.90	0.97	0.97	0.95	0.96	0.94	0.97	0.97	1.32														
ITA	0.89	0.95	0.96	0.96	0.96	0.95	0.97	0.97	0.95	1.33													
NLD	0.90	0.96	0.97	0.97	0.98	0.96	0.97	0.97	0.97	0.95	4.85												
USA	0.89	0.95	0.96	0.96	0.96	0.96	0.97	0.97	0.97	0.96	0.96	1.47											
HUN	0.88	0.95	0.97	0.95	0.95	0.95	0.96	0.95	0.95	0.95	0.95	0.95	1.01										
POL	0.89	0.95	0.94	0.94	0.95	0.94	0.94	0.94	0.93	0.93	0.94	0.93	0.94	11.10									
ZAF	0.89	0.93	0.94	0.91	0.92	0.91	0.92	0.92	0.95	0.89	0.92	0.94	0.91	0.91	0.92								
JPN	0.89	0.95	0.97	0.96	0.96	0.97	0.97	0.97	0.94	0.97	0.95	0.97	0.95	0.94	0.90	1.23							
CZE	0.90	0.96	0.97	0.94	0.96	0.93	0.95	0.94	0.95	0.94	0.95	0.93	0.96	0.93	0.94	0.93	13.59						
EST	0.88	0.92	0.94	0.92	0.92	0.94	0.94	0.91	0.92	0.92	0.93	0.94	0.93	0.93	0.91	0.93	0.94	15.69					
IRL	0.89	0.93	0.90	0.92	0.90	0.89	0.91	0.91	0.96	0.90	0.92	0.93	0.88	0.89	0.95	0.89	0.90	0.88	1.29				
KOR	0.88	0.88	0.88	0.89	0.88	0.89	0.91	0.89	0.88	0.89	0.88	0.90	0.89	0.88	0.88	0.91	0.88	0.88	0.88	4.67			
SVN	0.88	0.93	0.94	0.93	0.95	0.91	0.93	0.93	0.91	0.94	0.94	0.91	0.93	0.94	0.89	0.92	0.95	0.93	0.87	0.88	15.90		
PRT	0.88	0.92	0.91	0.90	0.91	0.90	0.91	0.90	0.91	0.92	0.91	0.90	0.91	0.89	0.91	0.90	0.93	0.89	0.88	0.88	0.89	1.53	
LVA	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.36

HOL   ftp

	AUS	BEL	CAN	CHE	DEU	DFS	ESP	FRA	GBR	ITA	NLD	USA	HUN	POL	NZL	ZAF	JPN	CZE	EST	IRL	KOR	SVN	PRT	LVA
AUS	0.61																							
BEL	0.94	1.46																						
CAN	0.94	0.96	6.00																					
CHE	0.96	0.97	0.98	11.91																				
DEU	0.95	0.95	0.98	0.96	13.89																			
DFS	0.90	0.96	0.96	0.94	0.95	10.87																		

ESP 0.93 0.93 0.97 0.95 0.97 0.93 0.92
FRA 0.93 0.99 0.97 0.97 0.95 0.95 0.92 1.10
GBR 0.92 0.90 0.96 0.93 0.95 0.91 0.96 0.89 1.38
ITA 0.86 0.86 0.87 0.86 0.86 0.86 0.86 0.85 0.87 1.18
NLD 0.94 0.97 0.98 0.97 0.98 0.95 0.95 0.96 0.94 0.86 5.15
USA 0.86 0.87 0.92 0.88 0.91 0.92 0.92 0.86 0.95 0.87 0.90 1.38
HUN 0.95 0.93 0.95 0.95 0.95 0.91 0.95 0.92 0.92 0.86 0.94 0.88 0.93
POL 0.87 0.88 0.93 0.89 0.92 0.89 0.92 0.88 0.92 0.86 0.92 0.88 0.90 11.72
NZL 0.91 0.89 0.92 0.90 0.90 0.86 0.89 0.90 0.91 0.86 0.91 0.87 0.89 0.88 0.31
ZAF 0.91 0.91 0.94 0.92 0.91 0.89 0.93 0.91 0.93 0.86 0.92 0.88 0.92 0.87 0.90 0.82
JPN 0.93 0.98 0.97 0.97 0.95 0.95 0.93 0.98 0.90 0.86 0.97 0.86 0.92 0.89 0.89 0.92 1.49
CZE 0.94 0.95 0.96 0.95 0.95 0.92 0.95 0.93 0.92 0.86 0.96 0.87 0.96 0.91 0.90 0.92 0.95 13.15
EST 0.94 0.94 0.95 0.95 0.94 0.91 0.93 0.93 0.91 0.86 0.95 0.86 0.93 0.90 0.87 0.89 0.95 0.95 18.81
IRL 0.90 0.87 0.93 0.90 0.93 0.89 0.92 0.87 0.96 0.86 0.91 0.89 0.88 0.86 0.87 0.90 0.88 0.87 0.89 1.31
KOR 0.88 0.91 0.90 0.91 0.89 0.90 0.90 0.90 0.86 0.86 0.89 0.86 0.91 0.86 0.86 0.90 0.92 0.90 0.89 0.85 3.22
SVN 0.94 0.94 0.95 0.95 0.97 0.94 0.96 0.93 0.93 0.86 0.95 0.89 0.94 0.87 0.86 0.87 0.93 0.92 0.92 0.91 0.87 15.69
PRT 0.89 0.89 0.92 0.89 0.93 0.87 0.93 0.87 0.92 0.86 0.91 0.87 0.92 0.91 0.86 0.87 0.89 0.91 0.90 0.88 0.86 0.93 1.51
LVA 0.86 0.86 0.86 0.86 0.86 0.86 0.86 0.86 0.86 0.86 0.86 0.86 0.86 0.86 0.86 0.86 0.86 0.86 0.86 0.86 0.86 0.85 0.86 0.38

HOL   ft1

	AUS	BEL	CAN	CHE	DEU	DFS	ESP	FRA	GBR	ITA	NLD	USA	HUN	POL	ZAF	JPN	CZE	EST	IRL	KOR	SVN	PRT	LVA	NZL
AUS	0.78																							
BEL	0.94	1.42																						
CAN	0.95	0.92	5.24																					
CHE	0.93	0.97	0.91	11.32																				
DEU	0.94	0.98	0.95	0.97	13.56																			
DFS	0.93	0.97	0.93	0.98	0.98	10.85																		
ESP	0.93	0.98	0.93	0.96	0.98	0.97	1.09																	
FRA	0.94	0.90	0.98	0.90	0.93	0.91	0.91	1.07																
GBR	0.95	0.97	0.96	0.95	0.98	0.95	0.97	0.94	1.32															
ITA	0.89	0.93	0.93	0.91	0.93	0.92	0.92	0.92	0.95	1.41														
NLD	0.93	0.98	0.93	0.97	0.98	0.98	0.98	0.91	0.97	0.91	4.95													
USA	0.94	0.94	0.96	0.94	0.96	0.95	0.96	0.94	0.97	0.93	0.95	1.44												
HUN	0.89	0.96	0.89	0.96	0.94	0.95	0.95	0.89	0.92	0.89	0.95	0.90	1.12											
POL	0.92	0.96	0.91	0.96	0.97	0.97	0.96	0.90	0.95	0.92	0.96	0.94	0.96	11.21										
ZAF	0.92	0.93	0.89	0.91	0.91	0.93	0.94	0.89	0.92	0.90	0.92	0.91	0.91	0.93	0.87									
JPN	0.94	0.98	0.94	0.98	0.98	0.98	0.98	0.92	0.97	0.93	0.98	0.97	0.95	0.98	0.94	1.41								
CZE	0.93	0.96	0.92	0.97	0.97	0.97	0.97	0.90	0.96	0.92	0.97	0.95	0.95	0.98	0.92	0.98	14.38							
EST	0.92	0.94	0.90	0.94	0.96	0.96	0.94	0.90	0.93	0.91	0.94	0.91	0.94	0.96	0.89	0.95	0.96	16.14						
IRL	0.92	0.94	0.94	0.91	0.95	0.92	0.93	0.93	0.98	0.93	0.93	0.94	0.89	0.92	0.90	0.93	0.93	0.90	1.74					
KOR	0.90	0.93	0.89	0.93	0.93	0.93	0.94	0.89	0.93	0.89	0.94	0.91	0.92	0.93	0.90	0.94	0.93	0.90	0.90	4.33				
SVN	0.90	0.94	0.90	0.94	0.95	0.94	0.95	0.89	0.95	0.92	0.96	0.91	0.92	0.94	0.90	0.95	0.94	0.92	0.91	0.90	17.52			
PRT	0.89	0.95	0.91	0.93	0.95	0.95	0.94	0.89	0.94	0.91	0.95	0.93	0.91	0.94	0.89	0.95	0.95	0.93	0.93	0.90	0.91	1.85		
LVA	0.89	0.89	0.91	0.89	0.90	0.89	0.89	0.91	0.90	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.46	
NZL	0.93	0.90	0.93	0.89	0.92	0.90	0.91	0.93	0.93	0.90	0.92	0.91	0.89	0.89	0.88	0.90	0.89	0.89	0.92	0.89	0.88	0.89	0.88	0.55

HOL   rtp

	AUS	BEL	CAN	CHE	DEU	DFS	ESP	FRA	GBR	ITA	NLD	USA	POL	NZL	JPN	CZE	EST	IRL	KOR	SVN	PRT	ZAF	HUN	LVA
AUS	0.43																							
BEL	0.93	1.43																						
CAN	0.89	0.97	6.10																					
CHE	0.91	0.98	0.98	11.94																				
DEU	0.89	0.96	0.97	0.97	14.07																			
DFS	0.88	0.94	0.95	0.95	0.96	11.04																		
ESP	0.90	0.96	0.97	0.96	0.98	0.96	0.88																	
FRA	0.91	0.97	0.98	0.98	0.97	0.96	0.97	1.05																
GBR	0.91	0.96	0.97	0.96	0.97	0.95	0.97	0.98	1.48															
ITA	0.87	0.89	0.89	0.89	0.93	0.91	0.92	0.91	0.90	1.29														
NLD	0.91	0.96	0.98	0.97	0.98	0.97	0.98	0.98	0.98	0.91	5.07													
USA	0.89	0.94	0.95	0.93	0.95	0.97	0.96	0.94	0.97	0.90	0.96	1.59												
POL	0.88	0.93	0.94	0.92	0.96	0.93	0.96	0.94	0.93	0.90	0.95	0.91	11.25											
NZL	0.91	0.95	0.95	0.94	0.94	0.89	0.93	0.95	0.95	0.86	0.94	0.90	0.92	0.47										
JPN	0.91	0.97	0.98	0.97	0.96	0.96	0.97	0.97	0.96	0.91	0.98	0.96	0.94	0.94	1.57									
CZE	0.89	0.97	0.95	0.95	0.96	0.94	0.94	0.94	0.95	0.90	0.95	0.94	0.95	0.92	0.95	14.54								
EST	0.91	0.95	0.94	0.95	0.95	0.92	0.94	0.95	0.94	0.89	0.96	0.91	0.93	0.91	0.94	0.94	16.56							

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IRL     0.89   0.94   0.94   0.93   0.94   0.92   0.93   0.95   0.95   0.87   0.94   0.92   0.90   0.93   0.93   0.90   0.89   1.27
KOR     0.88   0.91   0.93   0.93   0.93   0.93   0.95   0.93   0.91   0.91   0.93   0.91   0.90   0.90   0.95   0.88   0.90   0.90   2.17
SVN     0.88   0.92   0.93   0.93   0.95   0.92   0.95   0.94   0.94   0.90   0.95   0.90   0.94   0.91   0.91   0.92   0.93   0.91   0.91  14.34
PRT     0.87   0.89   0.91   0.88   0.91   0.89   0.91   0.89   0.92   0.87   0.89   0.90   0.91   0.87   0.90   0.89   0.87   0.88   0.87   0.91   1.52
ZAF     0.89   0.87   0.87   0.87   0.87   0.87   0.87   0.87   0.87   0.87   0.87   0.87   0.87   0.86   0.88   0.88   0.87   0.87   0.87   0.88   0.87   0.56
HUN     0.89   0.95   0.94   0.94   0.97   0.95   0.96   0.96   0.96   0.90   0.96   0.95   0.96   0.92   0.95   0.95   0.94   0.91   0.90   0.94   0.90   0.87   1.06
LVA     0.86   0.92   0.91   0.91   0.90   0.90   0.92   0.92   0.91   0.88   0.93   0.87   0.92   0.88   0.91   0.92   0.94   0.86   0.89   0.92   0.89   0.86   0.92   0.44
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HOL   ocs

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        AUS    BEL    CAN    CHE    DEU    DFS    ESP    FRA    GBR    ITA    NLD    USA    HUN    POL    NZL    JPN    CZE    EST    IRL    KOR    SVN    PRT
AUS     0.98
BEL     0.58   1.24
CAN     0.61   0.69   4.73
CHE     0.61   0.79   0.86  11.19
DEU     0.58   0.69   0.79   0.85  12.92
DFS     0.64   0.69   0.72   0.81   0.87  10.21
ESP     0.65   0.69   0.76   0.81   0.86   0.87   0.79
FRA     0.56   0.76   0.72   0.88   0.87   0.87   0.88   1.09
GBR     0.66   0.72   0.79   0.90   0.92   0.87   0.87   0.89   1.03
ITA     0.53   0.71   0.74   0.83   0.82   0.81   0.85   0.87   0.82   0.79
NLD     0.58   0.70   0.73   0.82   0.89   0.88   0.86   0.85   0.88   0.79   2.88
USA     0.60   0.69   0.77   0.87   0.88   0.88   0.86   0.86   0.90   0.84   0.86   0.89
HUN     0.56   0.72   0.72   0.80   0.81   0.73   0.76   0.79   0.81   0.78   0.73   0.76   1.03
POL     0.47   0.67   0.59   0.64   0.63   0.67   0.66   0.69   0.64   0.70   0.65   0.65   0.64  10.78
NZL     0.78   0.49   0.64   0.63   0.62   0.60   0.61   0.55   0.71   0.49   0.64   0.68   0.56   0.40   0.30
JPN     0.56   0.80   0.79   0.92   0.76   0.76   0.78   0.83   0.78   0.81   0.77   0.82   0.73   0.69   0.50   0.59
CZE     0.61   0.71   0.80   0.81   0.86   0.76   0.78   0.78   0.80   0.75   0.77   0.79   0.83   0.64   0.66   0.72  13.23
EST     0.55   0.68   0.68   0.69   0.74   0.70   0.67   0.71   0.68   0.65   0.72   0.65   0.72   0.65   0.48   0.69   0.75  19.17
IRL     0.59   0.51   0.67   0.68   0.70   0.65   0.66   0.62   0.79   0.64   0.62   0.65   0.63   0.47   0.56   0.65   0.65   0.55   0.89
KOR     0.56   0.64   0.59   0.65   0.66   0.64   0.69   0.68   0.64   0.69   0.65   0.66   0.64   0.66   0.41   0.66   0.64   0.68   0.48   6.47
SVN     0.51   0.74   0.62   0.67   0.74   0.70   0.65   0.69   0.69   0.71   0.67   0.68   0.65   0.64   0.45   0.68   0.66   0.75   0.54   0.66  16.73
PRT     0.55   0.69   0.67   0.72   0.79   0.78   0.77   0.77   0.81   0.77   0.78   0.76   0.70   0.67   0.49   0.75   0.72   0.63   0.60   0.66   0.63   0.29
```

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```
        AUS    BEL    CAN    CHE    DEU    DFS    ESP    FRA    GBR    ITA    NLD    USA    HUN    POL    NZL    JPN    CZE    EST    IRL    SVN    PRT
AUS     1.29
BEL     0.67   1.31
CAN     0.71   0.80   5.84
CHE     0.80   0.85   0.94  11.78
DEU     0.75   0.79   0.90   0.92  13.67
DFS     0.64   0.83   0.86   0.89   0.87  13.01
ESP     0.75   0.69   0.80   0.88   0.84   0.77   0.87
FRA     0.68   0.82   0.87   0.94   0.90   0.91   0.82   1.02
GBR     0.84   0.69   0.80   0.87   0.84   0.70   0.88   0.75   1.39
ITA     0.68   0.70   0.81   0.91   0.84   0.83   0.90   0.88   0.82   0.98
NLD     0.67   0.82   0.88   0.94   0.92   0.89   0.82   0.94   0.76   0.84   4.68
USA     0.75   0.74   0.89   0.92   0.86   0.78   0.86   0.82   0.88   0.86   0.84   1.19
HUN     0.70   0.78   0.81   0.86   0.86   0.80   0.81   0.81   0.76   0.77   0.77   0.77   1.16
POL     0.70   0.79   0.73   0.78   0.77   0.71   0.70   0.73   0.76   0.70   0.71   0.72   0.72  11.38
NZL     0.81   0.70   0.83   0.88   0.79   0.69   0.78   0.80   0.84   0.73   0.80   0.88   0.74   0.71   0.42
JPN     0.76   0.82   0.91   0.94   0.89   0.80   0.80   0.85   0.84   0.84   0.85   0.89   0.79   0.81   0.82   0.74
CZE     0.70   0.86   0.87   0.91   0.93   0.90   0.80   0.92   0.76   0.82   0.88   0.81   0.88   0.75   0.75   0.85  13.06
EST     0.71   0.82   0.83   0.89   0.85   0.90   0.78   0.90   0.75   0.81   0.87   0.77   0.80   0.70   0.76   0.77   0.88  16.42
IRL     0.82   0.64   0.70   0.79   0.75   0.62   0.80   0.66   0.95   0.75   0.67   0.82   0.69   0.71   0.81   0.76   0.69   0.69   0.93
SVN     0.68   0.75   0.69   0.72   0.71   0.70   0.70   0.70   0.70   0.69   0.69   0.69   0.69   0.79   0.67   0.70   0.70   0.71   0.66  17.45
PRT     0.68   0.69   0.77   0.78   0.76   0.69   0.76   0.72   0.79   0.74   0.74   0.78   0.69   0.71   0.73   0.79   0.74   0.69   0.74   0.69   0.43
```

HOL   ofl

```
        AUS    BEL    CAN    CHE    DEU    DFS    ESP    FRA    GBR    ITA    NLD    USA    HUN    POL    JPN    CZE    EST    IRL    SVN    PRT
AUS     0.77
BEL     0.63   1.74
CAN     0.34   0.63   4.77
CHE     0.55   0.76   0.80  11.46
```

```
DEU   0.38   0.76   0.71   0.78  11.79
DFS   0.35   0.64   0.79   0.76   0.80  13.08
ESP   0.41   0.71   0.74   0.75   0.71   0.82   0.90
FRA   0.52   0.81   0.67   0.75   0.76   0.62   0.75   1.06
GBR   0.50   0.74   0.66   0.79   0.74   0.72   0.79   0.84   1.55
ITA   0.48   0.72   0.58   0.70   0.72   0.60   0.69   0.80   0.68   1.65
NLD   0.42   0.82   0.68   0.69   0.75   0.64   0.65   0.81   0.74   0.67   4.69
USA   0.49   0.71   0.60   0.77   0.74   0.67   0.73   0.71   0.73   0.77   0.67   1.51
HUN   0.56   0.76   0.56   0.63   0.70   0.60   0.60   0.75   0.64   0.72   0.67   0.70   1.19
POL   0.47   0.69   0.56   0.67   0.68   0.60   0.60   0.66   0.60   0.70   0.60   0.73   0.71  13.55
JPN   0.43   0.64   0.64   0.78   0.78   0.72   0.70   0.62   0.62   0.71   0.61   0.85   0.62   0.74   0.54
CZE   0.47   0.75   0.62   0.72   0.78   0.63   0.66   0.69   0.64   0.78   0.63   0.83   0.80   0.83   0.80  17.13
EST   0.44   0.63   0.58   0.63   0.64   0.62   0.61   0.64   0.62   0.67   0.61   0.68   0.62   0.63   0.69  20.84
IRL   0.55   0.72   0.60   0.78   0.68   0.65   0.69   0.67   0.78   0.66   0.62   0.66   0.65   0.59   0.68   0.64   0.44   1.34
SVN   0.41   0.78   0.58   0.66   0.70   0.65   0.64   0.70   0.62   0.69   0.70   0.79   0.84   0.77   0.76   0.83   0.75   0.62  24.00
PRT   0.35   0.59   0.56   0.59   0.61   0.58   0.61   0.68   0.63   0.67   0.63   0.62   0.65   0.58   0.59   0.62   0.70   0.49   0.65   0.19
```

HOL   loc

	BEL	CAN	CHE	DEU	DFS	ESP	FRA	GBR	ITA	NLD	USA	CZE	IRL	KOR	SVN	PRT	EST	HUN	POL
BEL	1.81																		
CAN	0.85	6.77																	
CHE	0.56	0.63	12.39																
DEU	0.66	0.74	0.69	11.62															
DFS	0.88	0.90	0.51	0.68	13.24														
ESP	0.63	0.73	0.68	0.74	0.74	0.96													
FRA	0.80	0.79	0.72	0.83	0.70	0.76	1.06												
GBR	0.67	0.69	0.88	0.82	0.64	0.79	0.86	1.51											
ITA	0.62	0.69	0.65	0.74	0.59	0.75	0.79	0.73	1.93										
NLD	0.85	0.83	0.69	0.82	0.78	0.69	0.82	0.78	0.64	4.31									
USA	0.65	0.77	0.50	0.78	0.72	0.73	0.76	0.68	0.75	0.67	1.58								
CZE	0.51	0.62	0.55	0.64	0.61	0.65	0.64	0.66	0.70	0.50	0.64	20.33							
IRL	0.59	0.56	0.51	0.64	0.52	0.63	0.68	0.72	0.61	0.62	0.56	0.50	1.64						
KOR	0.58	0.66	0.54	0.52	0.59	0.67	0.67	0.55	0.57	0.57	0.52	0.57	0.51	10.55					
SVN	0.73	0.66	0.57	0.68	0.68	0.68	0.76	0.67	0.65	0.59	0.64	0.70	0.53	0.56	29.10				
PRT	0.50	0.50	0.55	0.61	0.50	0.59	0.53	0.61	0.58	0.52	0.50	0.65	0.50	0.52	0.68	2.21			
EST	0.55	0.53	0.52	0.52	0.52	0.53	0.53	0.53	0.52	0.51	0.51	0.53	0.52	0.66	0.66	0.53	22.62		
HUN	0.69	0.70	0.51	0.67	0.72	0.60	0.75	0.68	0.64	0.66	0.65	0.82	0.51	0.67	0.71	0.57	0.63	1.18	
POL	0.51	0.56	0.51	0.66	0.50	0.55	0.66	0.57	0.62	0.50	0.69	0.73	0.51	0.51	0.76	0.51	0.53	0.67	15.73

HOL   bcs

	BEL	CHE	DEU	DFS	FRA	GBR	ITA	NLD	USA	CZE	JPN	IRL	KOR	CAN	PRT	ESP	SVN	EST	HUN	NZL	POL
BEL	0.99																				
CHE	0.73	11.76																			
DEU	0.73	0.90	13.38																		
DFS	0.77	0.89	0.95	12.18																	
FRA	0.74	0.93	0.94	0.95	0.99																
GBR	0.76	0.91	0.90	0.90	0.93	1.51															
ITA	0.73	0.91	0.95	0.95	0.96	0.90	6.62														
NLD	0.73	0.93	0.95	0.96	0.95	0.91	0.94	5.01													
USA	0.77	0.73	0.79	0.79	0.79	0.76	0.77	0.76	1.38												
CZE	0.74	0.87	0.96	0.95	0.92	0.89	0.94	0.93	0.76	13.88											
JPN	0.81	0.92	0.96	0.97	0.97	0.93	0.96	0.95	0.84	0.95	1.70										
IRL	0.73	0.87	0.80	0.85	0.87	0.93	0.83	0.85	0.73	0.77	0.86	1.00									
KOR	0.73	0.75	0.85	0.85	0.86	0.81	0.84	0.79	0.74	0.85	0.87	0.74	2.47								
CAN	0.75	0.93	0.96	0.94	0.95	0.95	0.94	0.95	0.80	0.94	0.98	0.87	0.84	6.08							
PRT	0.72	0.85	0.87	0.86	0.88	0.87	0.84	0.86	0.72	0.83	0.87	0.81	0.83	0.88	1.85						
ESP	0.74	0.88	0.93	0.93	0.95	0.93	0.92	0.91	0.75	0.91	0.94	0.83	0.87	0.95	0.88	1.03					
SVN	0.74	0.87	0.91	0.91	0.88	0.80	0.89	0.91	0.73	0.90	0.89	0.75	0.77	0.85	0.75	0.85	21.85				
EST	0.74	0.83	0.88	0.87	0.87	0.76	0.85	0.90	0.81	0.85	0.87	0.74	0.74	0.83	0.74	0.78	0.86	16.45			
HUN	0.73	0.87	0.94	0.92	0.93	0.87	0.94	0.90	0.75	0.95	0.93	0.76	0.85	0.93	0.84	0.91	0.85	0.82	0.99		
NZL	0.71	0.90	0.92	0.92	0.93	0.92	0.91	0.89	0.74	0.89	0.92	0.88	0.80	0.92	0.85	0.88	0.84	0.81	0.89	0.16	
POL	0.74	0.85	0.92	0.89	0.91	0.89	0.91	0.87	0.75	0.92	0.92	0.80	0.79	0.91	0.86	0.88	0.84	0.77	0.91	0.85	11.39

JER   sta

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--------------------------------------------------------------------------------
        AUS    CAN    DFS    GBR    ITA    NZL    USA    ZAF    NLD    CHE
AUS    0.54
CAN    0.89   6.75
DFS    0.90   0.96  11.78
GBR    0.91   0.96   0.94   1.09
ITA    0.89   0.94   0.92   0.94   1.36
NZL    0.87   0.84   0.85   0.90   0.85   0.36
USA    0.90   0.97   0.95   0.96   0.93   0.88   1.70
ZAF    0.87   0.86   0.85   0.92   0.85   0.89   0.86   8.93
NLD    0.89   0.95   0.97   0.94   0.92   0.85   0.93   0.86   4.82
CHE    0.90   0.96   0.96   0.95   0.93   0.85   0.94   0.87   0.97  11.35


--------------------------------------------------------------------------------
JER    cwi
--------------------------------------------------------------------------------
        AUS    CAN    DFS    GBR    ITA    NZL    USA    ZAF    NLD    CHE
AUS    0.30
CAN    0.72   6.55
DFS    0.75   0.84  15.69
GBR    0.80   0.92   0.85   1.82
ITA    0.66   0.79   0.71   0.72   1.44
NZL    0.80   0.69   0.67   0.76   0.66   0.37
USA    0.73   0.90   0.81   0.84   0.88   0.67   1.03
ZAF    0.68   0.79   0.72   0.82   0.71   0.78   0.77   8.67
NLD    0.74   0.91   0.89   0.90   0.71   0.70   0.83   0.80   4.43
CHE    0.67   0.87   0.86   0.83   0.84   0.67   0.87   0.72   0.86  12.30


--------------------------------------------------------------------------------
JER    bde
--------------------------------------------------------------------------------
        AUS    CAN    DFS    GBR    ITA    NZL    ZAF    NLD    USA    CHE
AUS    0.33
CAN    0.75   5.69
DFS    0.77   0.85  13.64
GBR    0.74   0.85   0.84   1.54
ITA    0.70   0.74   0.76   0.82   1.45
NZL    0.78   0.69   0.70   0.69   0.70   0.37
ZAF    0.80   0.73   0.83   0.81   0.73   0.77   8.86
NLD    0.70   0.82   0.83   0.90   0.87   0.70   0.78   4.66
USA    0.69   0.71   0.74   0.77   0.90   0.69   0.72   0.87   1.03
CHE    0.77   0.87   0.90   0.89   0.84   0.71   0.82   0.90   0.85  13.37


--------------------------------------------------------------------------------
JER    ang
--------------------------------------------------------------------------------
        AUS    CAN    DFS    GBR    ITA    USA    ZAF    NLD    CHE
AUS    0.34
CAN    0.66   7.62
DFS    0.70   0.82  13.29
GBR    0.78   0.80   0.86   1.23
ITA    0.66   0.82   0.81   0.84   1.33
USA    0.70   0.83   0.87   0.83   0.76   1.04
ZAF    0.62   0.63   0.67   0.80   0.70   0.68   8.77
NLD    0.71   0.82   0.73   0.82   0.78   0.73   0.65   6.03
CHE    0.63   0.80   0.71   0.72   0.74   0.72   0.65   0.75   9.80


--------------------------------------------------------------------------------
JER    ran
--------------------------------------------------------------------------------
        AUS    CAN    DFS    GBR    ITA    NZL    USA    ZAF    NLD    CHE
AUS    0.36
CAN    0.89   5.82
DFS    0.90   0.96  11.60
GBR    0.95   0.95   0.95   1.16
ITA    0.89   0.95   0.93   0.93   1.22
NZL    0.91   0.88   0.88   0.92   0.88   0.30
USA    0.90   0.95   0.96   0.97   0.93   0.90   1.22
ZAF    0.90   0.89   0.89   0.90   0.89   0.88   0.89   9.02
```

```
NLD      0.91   0.96   0.96   0.96   0.94   0.89   0.95   0.92   4.74
CHE      0.92   0.96   0.95   0.95   0.93   0.89   0.94   0.90   0.95  12.98


--------------------------------------------------------------------------------
JER    rwi
--------------------------------------------------------------------------------
          AUS    CAN    DFS    GBR    ITA    NZL    USA    ZAF    NLD    CHE
AUS      0.32
CAN      0.81   6.32
DFS      0.81   0.91  12.12
GBR      0.81   0.92   0.85   1.44
ITA      0.79   0.85   0.82   0.86   1.61
NZL      0.88   0.82   0.82   0.80   0.79   0.30
USA      0.78   0.82   0.82   0.85   0.85   0.78   1.03
ZAF      0.78   0.79   0.80   0.81   0.79   0.77   0.79   9.27
NLD      0.85   0.94   0.91   0.88   0.80   0.85   0.81   0.80   5.08
CHE      0.84   0.93   0.84   0.86   0.81   0.81   0.80   0.79   0.92  11.89


--------------------------------------------------------------------------------
JER    rls
--------------------------------------------------------------------------------
          AUS    CAN    DFS    GBR    ITA    NZL    USA    ZAF    NLD    CHE
AUS      0.18
CAN      0.67   6.13
DFS      0.69   0.91  12.64
GBR      0.73   0.85   0.76   1.73
ITA      0.70   0.82   0.82   0.77   1.55
NZL      0.66   0.67   0.67   0.70   0.68   0.12
USA      0.69   0.94   0.90   0.88   0.82   0.66   0.96
ZAF      0.72   0.68   0.69   0.78   0.72   0.83   0.75  11.92
NLD      0.73   0.91   0.91   0.85   0.85   0.67   0.87   0.75   3.54
CHE      0.76   0.92   0.86   0.82   0.80   0.70   0.86   0.73   0.90   9.51


--------------------------------------------------------------------------------
JER    rlr
--------------------------------------------------------------------------------
          AUS    CAN    DFS    ITA    ZAF    NLD    USA    CHE
AUS      0.21
CAN      0.53   6.61
DFS      0.55   0.76  13.62
ITA      0.56   0.80   0.65   1.01
ZAF      0.53   0.55   0.53   0.57  12.87
NLD      0.57   0.86   0.88   0.73   0.62   4.58
USA      0.52   0.74   0.64   0.81   0.54   0.74   0.96
CHE      0.65   0.69   0.63   0.62   0.56   0.70   0.58  12.18

--------------------------------------------------------------------------------
JER    fan
--------------------------------------------------------------------------------
          AUS    CAN    DFS    GBR    ITA    USA    ZAF    NLD    CHE
AUS      0.22
CAN      0.62   6.07
DFS      0.64   0.87  12.78
GBR      0.72   0.78   0.74   1.50
ITA      0.64   0.75   0.69   0.75   1.67
USA      0.63   0.87   0.79   0.85   0.83   0.92
ZAF      0.67   0.65   0.68   0.85   0.66   0.75   9.69
NLD      0.68   0.75   0.78   0.86   0.72   0.78   0.71   3.86
CHE      0.66   0.79   0.80   0.69   0.68   0.71   0.68   0.73  11.89


--------------------------------------------------------------------------------
JER    fua
--------------------------------------------------------------------------------
          AUS    CAN    DFS    GBR    ITA    NZL    USA    ZAF    NLD    CHE
AUS      0.38
CAN      0.75   5.54
DFS      0.73   0.86  12.83
GBR      0.77   0.94   0.86   1.63
ITA      0.69   0.86   0.78   0.87   1.41
```

```
NZL     0.80    0.73    0.74    0.81    0.70    0.42
USA     0.75    0.94    0.87    0.92    0.90    0.72    1.63
ZAF     0.73    0.91    0.87    0.93    0.82    0.74    0.89   11.83
NLD     0.76    0.92    0.89    0.92    0.83    0.82    0.87    0.87    4.73
CHE     0.80    0.91    0.84    0.87    0.82    0.71    0.86    0.88    0.90   11.67

--------------------------------------------------------------------------------
JER     ruh
--------------------------------------------------------------------------------
        AUS     CAN     DFS     GBR     ITA     NZL     USA     ZAF     NLD     CHE
AUS     0.35
CAN     0.73    6.87
DFS     0.75    0.84   10.69
GBR     0.81    0.80    0.82    1.29
ITA     0.74    0.76    0.80    0.84    1.37
NZL     0.72    0.72    0.76    0.76    0.79    0.41
USA     0.77    0.84    0.89    0.91    0.82    0.74    1.26
ZAF     0.82    0.74    0.80    0.88    0.81    0.77    0.85    9.29
NLD     0.75    0.76    0.91    0.88    0.83    0.82    0.86    0.79    4.21
CHE     0.79    0.92    0.86    0.83    0.78    0.77    0.84    0.78    0.83   13.12

--------------------------------------------------------------------------------
JER     usu
--------------------------------------------------------------------------------
        AUS     CAN     DFS     GBR     ITA     NZL     USA     ZAF     NLD     CHE
AUS     0.38
CAN     0.76    6.38
DFS     0.71    0.85   13.44
GBR     0.81    0.87    0.85    1.82
ITA     0.67    0.76    0.71    0.80    1.52
NZL     0.59    0.59    0.59    0.64    0.64    0.40
USA     0.73    0.83    0.88    0.84    0.79    0.60    0.99
ZAF     0.77    0.79    0.73    0.81    0.64    0.59    0.77   10.12
NLD     0.81    0.83    0.88    0.91    0.80    0.60    0.88    0.79    4.82
CHE     0.75    0.90    0.86    0.79    0.78    0.61    0.83    0.76    0.86    9.90

--------------------------------------------------------------------------------
JER     ude
--------------------------------------------------------------------------------
        AUS     CAN     DFS     GBR     ITA     USA     ZAF     NLD     CHE
AUS     0.35
CAN     0.91    5.29
DFS     0.90    0.94   12.18
GBR     0.90    0.97    0.93    1.47
ITA     0.91    0.94    0.93    0.93    1.31
USA     0.89    0.96    0.95    0.94    0.95    1.82
ZAF     0.89    0.89    0.91    0.92    0.89    0.89   10.47
NLD     0.91    0.96    0.95    0.96    0.94    0.95    0.91    4.18
CHE     0.94    0.95    0.94    0.93    0.95    0.94    0.90    0.96    9.96

--------------------------------------------------------------------------------
JER     ftp
--------------------------------------------------------------------------------
        AUS     CAN     DFS     GBR     ITA     NZL     USA     ZAF     NLD     CHE
AUS     0.46
CAN     0.89    6.38
DFS     0.88    0.92   12.74
GBR     0.91    0.94    0.89    1.34
ITA     0.86    0.87    0.86    0.86    1.78
NZL     0.88    0.92    0.87    0.88    0.87    0.30
USA     0.86    0.95    0.92    0.93    0.86    0.88    1.34
ZAF     0.87    0.93    0.88    0.93    0.86    0.90    0.90   10.22
NLD     0.93    0.97    0.94    0.94    0.86    0.90    0.90    0.90    5.62
CHE     0.92    0.95    0.92    0.91    0.86    0.88    0.90    0.88    0.96   10.11

--------------------------------------------------------------------------------
JER     ftl
--------------------------------------------------------------------------------
        AUS     CAN     DFS     GBR     ITA     USA     ZAF     NLD     CHE     NZL
```

```
AUS       0.33
CAN       0.91    5.61
DFS       0.92    0.91   13.84
GBR       0.92    0.93    0.94    1.45
ITA       0.90    0.92    0.91    0.93    1.66
USA       0.91    0.92    0.94    0.97    0.92    1.11
ZAF       0.92    0.90    0.92    0.95    0.90    0.97   10.98
NLD       0.93    0.93    0.97    0.97    0.91    0.95    0.93    4.69
CHE       0.92    0.92    0.94    0.96    0.91    0.94    0.93    0.96   11.60
NZL       0.92    0.94    0.93    0.94    0.91    0.94    0.93    0.92    0.91    0.53

-------------------------------------------------------------------------------
JER    rtp
-------------------------------------------------------------------------------
          AUS     CAN     DFS     NZL     ZAF     NLD     USA     CHE
AUS       0.32
CAN       0.88    6.43
DFS       0.88    0.94   13.06
NZL       0.87    0.96    0.91    0.42
ZAF       0.88    0.92    0.89    0.87    9.46
NLD       0.90    0.97    0.95    0.92    0.89    4.97
USA       0.88    0.91    0.95    0.87    0.88    0.94    1.41
CHE       0.90    0.98    0.95    0.94    0.93    0.96    0.92   11.05

-------------------------------------------------------------------------------
JER    ocs
-------------------------------------------------------------------------------
          AUS     CAN     DFS     GBR     ITA     NZL     USA     NLD     CHE
AUS       0.78
CAN       0.55    5.27
DFS       0.54    0.66   12.77
GBR       0.64    0.79    0.82    2.65
ITA       0.52    0.76    0.73    0.81    0.72
NZL       0.62    0.56    0.47    0.55    0.52    0.31
USA       0.64    0.79    0.72    0.86    0.78    0.57    0.88
NLD       0.60    0.74    0.85    0.88    0.79    0.63    0.83    2.97
CHE       0.59    0.86    0.76    0.90    0.81    0.53    0.79    0.83    8.10

-------------------------------------------------------------------------------
JER    ous
-------------------------------------------------------------------------------
          AUS     CAN     DFS     GBR     NZL     USA     NLD     CHE
AUS       0.79
CAN       0.68    6.31
DFS       0.63    0.82   12.82
GBR       0.74    0.83    0.70    1.43
NZL       0.81    0.74    0.69    0.73    0.45
USA       0.67    0.89    0.76    0.84    0.71    1.04
NLD       0.67    0.88    0.89    0.77    0.78    0.86    4.49
CHE       0.74    0.88    0.80    0.87    0.78    0.86    0.92   11.01

-------------------------------------------------------------------------------
JER    ofl
-------------------------------------------------------------------------------
          AUS     CAN     DFS     GBR     ITA     USA     NLD     CHE
AUS       6.32
CAN       0.49    5.00
DFS       0.39    0.76   13.65
GBR       0.58    0.67    0.64    1.33
ITA       0.43    0.66    0.60    0.71    1.07
USA       0.66    0.75    0.63    0.69    0.76    1.62
NLD       0.43    0.68    0.65    0.73    0.67    0.66    4.59
CHE       0.50    0.84    0.70    0.71    0.68    0.74    0.69   10.50

-------------------------------------------------------------------------------
RDC    sta
-------------------------------------------------------------------------------
          AUS     CAN     DEU     DFS     GBR     NOR     NZL     USA     NLD     CAM     LVA
AUS       0.64
```

```
CAN      0.88    6.22
DEU      0.89    0.97   13.47
DFS      0.87    0.96    0.97    8.63
GBR      0.92    0.96    0.96    0.93    1.30
NOR      0.88    0.94    0.94    0.98    0.92   13.60
NZL      0.88    0.89    0.86    0.89    0.92    0.92    0.48
USA      0.90    0.97    0.96    0.94    0.97    0.91    0.89    2.35
NLD      0.88    0.95    0.97    0.97    0.94    0.96    0.84    0.93    4.66
CAM      0.92    0.91    0.91    0.91    0.91    0.91    0.91    0.90    0.90    5.53
LVA      0.86    0.85    0.86    0.92    0.84    0.91    0.86    0.84    0.86    0.90    0.63
```

RDC   cwi

```
          AUS     CAN     DEU     DFS     GBR     NZL     USA     NLD     CAM     NOR     LVA
AUS      0.41
CAN      0.73    7.34
DEU      0.71    0.88   11.35
DFS      0.77    0.83    0.89   13.70
GBR      0.82    0.88    0.89    0.87    1.60
NZL      0.80    0.69    0.71    0.68    0.81    0.35
USA      0.67    0.85    0.81    0.83    0.84    0.71    1.28
NLD      0.73    0.92    0.92    0.89    0.91    0.68    0.81    4.59
CAM      0.78    0.79    0.79    0.79    0.79    0.82    0.79    0.79    6.71
NOR      0.81    0.80    0.80    0.87    0.82    0.80    0.82    0.87    0.80   14.08
LVA      0.68    0.74    0.69    0.67    0.67    0.70    0.67    0.74    0.79    0.80    0.30
```

RDC   bde

```
          AUS     CAN     DEU     DFS     GBR     NOR     NZL     USA     NLD     CAM     LVA
AUS      0.49
CAN      0.80    6.05
DEU      0.77    0.87    9.80
DFS      0.79    0.83    0.92   11.84
GBR      0.78    0.86    0.92    0.89    1.58
NOR      0.79    0.81    0.81    0.89    0.83   14.85
NZL      0.77    0.70    0.72    0.74    0.75    0.81    0.35
USA      0.71    0.76    0.89    0.83    0.89    0.83    0.73    1.30
NLD      0.70    0.83    0.90    0.85    0.91    0.84    0.69    0.90    4.19
CAM      0.83    0.82    0.84    0.83    0.83    0.83    0.86    0.84    0.83    4.78
LVA      0.74    0.77    0.80    0.80    0.78    0.84    0.76    0.70    0.73    0.83    0.35
```

RDC   ang

```
          AUS     CAN     DEU     DFS     GBR     USA     NLD     CAM     NOR     LVA
AUS      0.47
CAN      0.65    6.76
DEU      0.64    0.80   12.65
DFS      0.70    0.76    0.81    9.11
GBR      0.76    0.81    0.76    0.84    1.39
USA      0.69    0.86    0.83    0.82    0.85    1.20
NLD      0.73    0.81    0.62    0.75    0.83    0.74    4.73
CAM      0.81    0.77    0.78    0.78    0.78    0.79    0.79    7.09
NOR      0.74    0.76    0.79    0.63    0.77    0.79    0.72    0.77   16.14
LVA      0.66    0.64    0.63    0.62    0.63    0.62    0.64    0.77    0.77    0.29
```

RDC   ran

```
          AUS     CAN     DEU     DFS     GBR     NOR     NZL     USA     NLD     CAM     LVA
AUS      0.42
CAN      0.90    6.02
DEU      0.92    0.97    8.93
DFS      0.91    0.94    0.95   10.02
GBR      0.93    0.97    0.97    0.95    1.55
NOR      0.91    0.94    0.91    0.90    0.94   12.11
NZL      0.92    0.90    0.89    0.88    0.92    0.92    0.28
```

```
USA      0.90    0.98    0.96    0.94    0.97    0.94    0.91    1.68
NLD      0.91    0.96    0.98    0.96    0.97    0.94    0.88    0.96    5.92
CAM      0.93    0.93    0.93    0.93    0.93    0.93    0.93    0.94    0.93    5.52
LVA      0.89    0.93    0.92    0.91    0.91    0.89    0.89    0.91    0.92    0.92    0.41
-------------------------------------------------------------------------------------

RDC     rwi
-------------------------------------------------------------------------------------

         AUS     CAN     DEU     DFS     GBR     NZL     USA     NLD     CAM     NOR     LVA
AUS      0.46
CAN      0.85    5.91
DEU      0.82    0.94    9.59
DFS      0.80    0.93    0.93   10.48
GBR      0.85    0.92    0.90    0.88    1.41
NZL      0.83    0.90    0.82    0.89    0.90    0.33
USA      0.79    0.91    0.85    0.89    0.94    0.87    1.42
NLD      0.84    0.94    0.96    0.93    0.89    0.89    0.84    0.81    6.15
CAM      0.86    0.88    0.87    0.88    0.87    0.89    0.87    0.88    6.57
NOR      0.85    0.88    0.86    0.94    0.87    0.89    0.88    0.89    0.88   13.83
LVA      0.79    0.82    0.82    0.86    0.78    0.82    0.77    0.82    0.86    0.87    0.41

-------------------------------------------------------------------------------------

RDC     rls
-------------------------------------------------------------------------------------

         AUS     CAN     DEU     DFS     GBR     NOR     NZL     USA     NLD     CAM     LVA
AUS      0.23
CAN      0.69    6.50
DEU      0.73    0.94    9.30
DFS      0.71    0.96    0.94    9.29
GBR      0.80    0.77    0.85    0.79    1.60
NOR      0.74    0.87    0.86    0.95    0.80   11.85
NZL      0.70    0.67    0.68    0.67    0.71    0.74    0.12
USA      0.71    0.93    0.93    0.93    0.82    0.84    0.67    0.90
NLD      0.73    0.92    0.92    0.89    0.86    0.80    0.66    0.90    5.21
CAM      0.81    0.80    0.80    0.79    0.79    0.80    0.79    0.80    0.80    6.51
LVA      0.70    0.78    0.83    0.76    0.75    0.72    0.72    0.77    0.82    0.80    0.28

-------------------------------------------------------------------------------------

RDC     rlr
-------------------------------------------------------------------------------------

         AUS     CAN     DEU     DFS     NOR     NLD     USA     CAM     LVA
AUS      0.18
CAN      0.58    6.57
DEU      0.61    0.87   10.23
DFS      0.56    0.83    0.90   10.92
NOR      0.59    0.75    0.80    0.83   13.19
NLD      0.57    0.87    0.90    0.88    0.80    4.70
USA      0.55    0.72    0.77    0.68    0.71    0.80    0.90
CAM      0.76    0.72    0.72    0.71    0.71    0.71    0.71    6.83
LVA      0.59    0.74    0.77    0.82    0.66    0.70    0.71    0.73    0.24

-------------------------------------------------------------------------------------

RDC     fan
-------------------------------------------------------------------------------------

         AUS     CAN     DEU     DFS     GBR     NOR     USA     NLD     CAM     LVA
AUS      0.29
CAN      0.65    6.43
DEU      0.70    0.81   14.10
DFS      0.64    0.70    0.80    9.34
GBR      0.74    0.79    0.91    0.72    1.61
NOR      0.69    0.73    0.84    0.62    0.77   12.85
USA      0.68    0.85    0.83    0.72    0.84    0.77    1.06
NLD      0.68    0.75    0.88    0.78    0.88    0.66    0.80    4.87
CAM      0.80    0.79    0.77    0.77    0.77    0.77    0.79    0.79    7.81
LVA      0.66    0.65    0.69    0.63    0.69    0.77    0.69    0.68    0.78    0.27

-------------------------------------------------------------------------------------

RDC     fua
-------------------------------------------------------------------------------------
```

```
            AUS     CAN     DEU     DFS     GBR     NOR     NZL     USA     NLD     CAM     LVA
AUS       0.38
CAN       0.77    5.60
DEU       0.75    0.91   12.43
DFS       0.73    0.81    0.84   11.71
GBR       0.77    0.88    0.95    0.87    1.54
NOR       0.70    0.82    0.76    0.84    0.80   11.97
NZL       0.77    0.81    0.81    0.69    0.78    0.72    0.36
USA       0.75    0.93    0.90    0.84    0.92    0.80    0.84    1.51
NLD       0.76    0.92    0.93    0.88    0.92    0.89    0.84    0.88    4.16
CAM       0.82    0.81    0.80    0.81    0.80    0.80    0.79    0.81    0.81    6.61
LVA       0.68    0.75    0.76    0.80    0.74    0.74    0.73    0.69    0.77    0.78    0.36


-------------------------------------------------------------------------------------
RDC    ruh
-------------------------------------------------------------------------------------
            AUS     CAN     DEU     DFS     GBR     NOR     NZL     USA     NLD     CAM     LVA
AUS       0.47
CAN       0.79    5.78
DEU       0.80    0.87   14.90
DFS       0.77    0.87    0.89   10.76
GBR       0.79    0.75    0.85    0.85    1.44
NOR       0.77    0.84    0.87    0.88    0.82   12.26
NZL       0.83    0.75    0.82    0.78    0.92    0.78    0.33
USA       0.77    0.84    0.90    0.92    0.89    0.84    0.85    1.37
NLD       0.75    0.75    0.91    0.91    0.88    0.91    0.83    0.85    4.22
CAM       0.85    0.83    0.82    0.83    0.84    0.83    0.85    0.83    0.82    6.18
LVA       0.73    0.74    0.76    0.84    0.73    0.75    0.75    0.74    0.76    0.83    0.39


-------------------------------------------------------------------------------------
RDC    usu
-------------------------------------------------------------------------------------
            AUS     CAN     DEU     DFS     GBR     NOR     NZL     USA     NLD     CAM     LVA
AUS       0.35
CAN       0.75    5.58
DEU       0.72    0.89   12.62
DFS       0.67    0.76    0.78   13.05
GBR       0.80    0.81    0.75    0.79    1.86
NOR       0.67    0.71    0.67    0.73    0.76   11.96
NZL       0.68    0.71    0.62    0.60    0.69    0.69    0.32
USA       0.78    0.82    0.75    0.84    0.89    0.78    0.70    1.22
NLD       0.78    0.83    0.80    0.90    0.92    0.81    0.58    0.90    4.57
CAM       0.80    0.78    0.76    0.76    0.78    0.76    0.79    0.78    0.77    5.94
LVA       0.63    0.65    0.62    0.60    0.75    0.70    0.68    0.70    0.68    0.76    0.32


-------------------------------------------------------------------------------------
RDC    ude
-------------------------------------------------------------------------------------
            AUS     CAN     DEU     DFS     GBR     NOR     USA     NLD     CAM     LVA
AUS       0.54
CAN       0.89    5.50
DEU       0.90    0.97   12.42
DFS       0.89    0.96    0.94   10.63
GBR       0.90    0.96    0.96    0.94    1.83
NOR       0.90    0.91    0.90    0.88    0.92   14.22
USA       0.89    0.97    0.96    0.95    0.96    0.92    1.31
NLD       0.90    0.97    0.97    0.95    0.97    0.91    0.96    4.19
CAM       0.93    0.93    0.93    0.93    0.93    0.92    0.93    0.93    4.44
LVA       0.89    0.89    0.88    0.91    0.88    0.89    0.88    0.88    0.92    0.42


-------------------------------------------------------------------------------------
RDC    ftp
-------------------------------------------------------------------------------------
            AUS     CAN     DEU     DFS     GBR     NOR     NZL     USA     NLD     CAM     LVA
AUS       0.53
CAN       0.92    5.56
DEU       0.93    0.97   13.09
DFS       0.89    0.94    0.92   11.91
GBR       0.92    0.93    0.95    0.89    1.50
```

```
NOR    0.89    0.92    0.89    0.94    0.91    14.23
NZL    0.92    0.90    0.90    0.87    0.89    0.89    0.26
USA    0.87    0.93    0.91    0.92    0.93    0.92    0.87    1.45
NLD    0.93    0.98    0.97    0.95    0.94    0.88    0.90    0.90    4.70
CAM    0.91    0.91    0.91    0.91    0.91    0.91    0.91    0.91    0.91    6.90
LVA    0.88    0.87    0.87    0.87    0.87    0.88    0.88    0.86    0.87    0.91    0.38
```

```
RDC    ftl
```

	AUS	CAN	DEU	DFS	GBR	NOR	USA	NLD	CAM	LVA	NZL
AUS	0.54										
CAN	0.93	4.95									
DEU	0.94	0.94	13.84								
DFS	0.92	0.91	0.97	10.57							
GBR	0.95	0.93	0.98	0.93	1.41						
NOR	0.92	0.93	0.93	0.93	0.94	12.90					
USA	0.94	0.93	0.96	0.92	0.97	0.94	1.65				
NLD	0.93	0.93	0.98	0.97	0.97	0.94	0.95	5.26			
CAM	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	7.38		
LVA	0.90	0.91	0.90	0.90	0.90	0.94	0.89	0.90	0.93	0.48	
NZL	0.94	0.93	0.92	0.92	0.94	0.93	0.92	0.92	0.94	0.92	0.43

```
RDC    rtp
```

	AUS	CAN	DEU	DFS	NOR	NZL	NLD	USA	CAM	LVA
AUS	0.39									
CAN	0.89	6.24								
DEU	0.89	0.96	14.27							
DFS	0.88	0.93	0.96	12.28						
NOR	0.90	0.91	0.89	0.88	13.08					
NZL	0.92	0.95	0.93	0.88	0.89	0.34				
NLD	0.90	0.98	0.97	0.96	0.89	0.94	5.44			
USA	0.89	0.92	0.95	0.92	0.92	0.89	0.96	1.45		
CAM	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	6.31	
LVA	0.92	0.91	0.89	0.90	0.88	0.91	0.93	0.88	0.91	0.38

```
RDC    ocs
```

	AUS	CAN	DEU	DFS	GBR	NOR	NZL	USA	NLD	CAM
AUS	1.13									
CAN	0.62	4.80								
DEU	0.59	0.78	20.48							
DFS	0.65	0.64	0.80	10.47						
GBR	0.67	0.77	0.91	0.77	1.61					
NOR	0.60	0.73	0.71	0.73	0.79	11.75				
NZL	0.72	0.57	0.60	0.49	0.64	0.69	0.27			
USA	0.63	0.79	0.88	0.75	0.88	0.79	0.68	0.57		
NLD	0.61	0.73	0.88	0.82	0.88	0.68	0.63	0.86	2.96	
CAM	0.73	0.78	0.78	0.78	0.78	0.79	0.72	0.80	0.79	6.28

```
RDC    ous
```

	AUS	CAN	DEU	DFS	GBR	NOR	NZL	USA	NLD	CAM
AUS	1.46									
CAN	0.71	5.39								
DEU	0.75	0.88	17.27							
DFS	0.65	0.80	0.82	10.80						
GBR	0.83	0.81	0.83	0.73	1.57					
NOR	0.69	0.80	0.81	0.79	0.84	13.77				
NZL	0.82	0.81	0.79	0.77	0.80	0.76	0.36			
USA	0.74	0.89	0.86	0.86	0.87	0.84	0.88	1.00		
NLD	0.68	0.88	0.91	0.88	0.77	0.80	0.80	0.85	3.97	
CAM	0.81	0.84	0.84	0.84	0.85	0.83	0.85	0.86	0.86	6.48

```
RDC     ofl
-----------------------------------------------------------------------------------------
          AUS     CAN     DEU     DFS     GBR     NOR     USA     NLD     CAM
AUS       0.62
CAN       0.40    4.45
DEU       0.41    0.78   16.17
DFS       0.38    0.80    0.80   13.54
GBR       0.50    0.71    0.73    0.67    1.39
NOR       0.49    0.70    0.67    0.58    0.75   12.89
USA       0.53    0.66    0.74    0.64    0.70    0.75    1.33
NLD       0.43    0.69    0.75    0.64    0.74    0.63    0.67    6.44
CAM       0.72    0.75    0.75    0.75    0.75    0.75    0.77    0.75    7.07
```

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^LAPPENDIX II. Number of common bulls

BSW

```
 common bulls below diagonal
 common three quarter sib group above diagonal
       CAN  CHE  FRA  ITA  NLD  USA  DEA  SVN  GBR
-----------------------------------------------------------------------------
 CAN     0  129   76  128   41  151  114   30   18
 CHE   113    0  158  472   67  268  521   65   16
 FRA    66  118    0  177   56   91  178   48   14
 ITA   111  411  139    0   89  210  567   85   17
 NLD    33   64   45   71    0   56   82   32   12
 USA   142  237   62  152   42    0  223   31   18
 DEA    95  427  131  483   72  178    0   82   14
 SVN    27   63   46   82   31   26   76    0    8
 GBR    15   14   13   15   10   16   12    6    0
-----------------------------------------------------------------------------
```
BSW

```
 common bulls below diagonal
 common three quarter sib group above diagonal
       CAN  CHE  FRA  ITA  NLD  USA  DEA  SVN  GBR
-----------------------------------------------------------------------------
 CAN     0  121   45  128   34  151  112   29   18
 CHE   106    0   95  417   62  239  458   62   16
 FRA    39   67    0  104   37   55  116   39   10
 ITA   111  357   80    0   81  210  531   83   17
 NLD    29   61   32   67    0   42   76   32   12
 USA   142  204   36  152   33    0  205   30   18
 DEA    94  368   82  446   70  153    0   80   13
 SVN    26   60   38   80   31   25   75    0    8
 GBR    15   14    9   15   10   16   12    6    0
-----------------------------------------------------------------------------
```
BSW

```
 common bulls below diagonal
 common three quarter sib group above diagonal
       CAN  CHE  FRA  ITA  NLD  DEA  SVN  GBR  USA
-----------------------------------------------------------------------------
 CAN     0  129   76  128   34  114   23   18  151
 CHE   113    0  158  472   66  521   51   16  268
 FRA    66  118    0  177   52  178   36   14   91
 ITA   111  411  139    0   81  567   67   17  210
 NLD    29   64   42   67    0   77   24   12   42
 DEA    95  427  131  483   71    0   63   14  223
 SVN    21   48   36   63   24   59    0    6   23
 GBR    15   14   13   15   10   12    4    0   18
 USA   142  237   62  152   33  178   20   16    0
-----------------------------------------------------------------------------
```
BSW

```
 common bulls below diagonal
 common three quarter sib group above diagonal
       CAN  CHE  FRA  NLD  USA  GBR
```

```
--------------------------------------------------------------------------------
 CAN    0  128   76   22  150   18
 CHE  113    0  154   43  266   16
 FRA   66  114    0   34   91   14
 NLD   19   44   29    0   27    9
 USA  141  237   62   22    0   18
 GBR   15   14   13    7   16    0
--------------------------------------------------------------------------------
BSW
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
       CAN  CHE  FRA  ITA  NLD  USA  DEA  SVN  GBR
--------------------------------------------------------------------------------
 CAN    0  129   76  128   41  151  114   30   18
 CHE  113    0  158  472   67  268  521   65   16
 FRA   66  118    0  177   56   91  178   48   14
 ITA  111  411  139    0   89  210  567   85   17
 NLD   33   64   45   71    0   56   82   32   12
 USA  142  237   62  152   42    0  223   31   18
 DEA   95  427  131  483   72  178    0   82   14
 SVN   27   63   46   82   31   26   76    0    8
 GBR   15   14   13   15   10   16   12    6    0
--------------------------------------------------------------------------------
BSW
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
       CAN  CHE  FRA  NLD  USA  DEA  GBR  SVN  ITA
--------------------------------------------------------------------------------
 CAN    0  129   45   41  151  114   18   23  124
 CHE  113    0   95   67  268  521   16   51  465
 FRA   39   67    0   37   55  116   10   36  104
 NLD   33   64   32    0   56   82   12   24   87
 USA  142  237   36   42    0  223   18   23  196
 DEA   95  427   82   72  178    0   14   63  561
 GBR   15   14    9   10   16   12    0    6   17
 SVN   21   48   36   24   20   59    4    0   67
 ITA  108  405   80   70  138  475   15   63    0
--------------------------------------------------------------------------------
BSW
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
       CAN  CHE  FRA  ITA  NLD  USA  DEA  SVN  GBR
--------------------------------------------------------------------------------
 CAN    0  129   76  128   41  151  114   30   18
 CHE  113    0  158  472   67  268  521   65   16
 FRA   66  118    0  177   56   91  178   48   14
 ITA  111  411  139    0   89  210  567   85   17
 NLD   33   64   45   71    0   56   82   32   12
 USA  142  237   62  152   42    0  223   31   18
 DEA   95  427  131  483   72  178    0   82   14
 SVN   27   63   46   82   31   26   76    0    8
 GBR   15   14   13   15   10   16   12    6    0
--------------------------------------------------------------------------------
BSW
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
       CAN  CHE  FRA  ITA  NLD  USA  DEA  SVN  GBR
--------------------------------------------------------------------------------
 CAN    0  129   76  128   33  151  114   30   18
 CHE  113    0  158  472   65  268  521   65   16
 FRA   66  118    0  177   52   91  178   48   14
 ITA  111  411  139    0   80  210  567   85   17
 NLD   28   63   42   66    0   41   76   32   12
 USA  142  237   62  152   31    0  223   31   18
 DEA   95  427  131  483   70  178    0   82   14
```

```
 SVN   27   63   46   82   31   26   76    0    8
 GBR   15   14   13   15   10   16   12    6    0
 --------------------------------------------------------------------------------
BSW
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
        CAN  CHE  FRA  ITA  NLD  DEA  SVN  USA
 --------------------------------------------------------------------------------

 CAN    0  129   76  124   33  114   30  151
 CHE  113    0  158  466   65  521   65  268
 FRA   66  118    0  176   52  178   48   91
 ITA  108  406  139    0   79  561   85  196
 NLD   28   63   42   65    0   76   32   41
 DEA   95  427  131  475   70    0   82  223
 SVN   27   63   46   82   31   76    0   31
 USA  142  237   62  138   31  178   26    0
 --------------------------------------------------------------------------------

BSW
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
        CAN  CHE  FRA  ITA  NLD  USA  DEA  SVN  GBR
 --------------------------------------------------------------------------------

 CAN    0  129   45   85   33  151   81   23   18
 CHE  113    0   95  301   66  267  327   51   16
 FRA   39   67    0   96   36   55  106   36   10
 ITA   76  250   73    0   60  112  284   60   14
 NLD   28   64   31   55    0   41   64   24   12
 USA  142  237   36   79   32    0  126   23   18
 DEA   69  261   75  249   59   89    0   62   11
 SVN   21   48   36   57   24   20   58    0    6
 GBR   15   14    9   12   10   16   10    4    0
 --------------------------------------------------------------------------------

BSW
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
        CAN  CHE  FRA  ITA  NLD  USA  DEA  SVN  GBR
 --------------------------------------------------------------------------------

 CAN    0  129   76  128   34  151  114   30   18
 CHE  113    0  158  472   66  268  521   65   16
 FRA   66  118    0  177   52   91  178   48   14
 ITA  111  411  139    0   81  210  567   85   17
 NLD   29   64   42   67    0   42   77   32   12
 USA  142  237   62  152   33    0  223   31   18
 DEA   95  427  131  483   71  178    0   83   14
 SVN   27   63   46   82   31   26   77    0    8
 GBR   15   14   13   15   10   16   12    6    0
 --------------------------------------------------------------------------------

BSW
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
        CAN  CHE  FRA  ITA  NLD  USA  DEA  SVN
 --------------------------------------------------------------------------------

 CAN    0  129   76  128   34  151  114   30
 CHE  113    0  158  472   66  268  521   65
 FRA   66  118    0  177   52   91  178   48
 ITA  111  411  139    0   81  210  567   85
 NLD   29   64   42   67    0   42   77   32
 USA  142  237   62  152   33    0  223   31
 DEA   95  427  131  483   71  178    0   83
 SVN   27   63   46   82   31   26   77    0
 --------------------------------------------------------------------------------

BSW
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
```

```
          CAN   CHE   FRA   ITA   NLD   USA   DEA   SVN   GBR
       ----------------------------------------------------------------------------
   CAN     0   129    76   128    41   151   114    23    18
   CHE   113     0   158   472    67   268   521    51    16
   FRA    66   118     0   177    56    91   178    36    14
   ITA   111   411   139     0    89   210   567    67    17
   NLD    33    64    45    71     0    56    82    24    12
   USA   142   237    62   152    42     0   223    23    18
   DEA    95   427   131   483    72   178     0    64    14
   SVN    21    48    36    63    24    20    60     0     6
   GBR    15    14    13    15    10    16    12     4     0
       ----------------------------------------------------------------------------

BSW
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
          CAN   CHE   FRA   ITA   NLD   USA   DEA   SVN   GBR
       ----------------------------------------------------------------------------
   CAN     0   129    76   128    41   149   114    30    18
   CHE   113     0   158   472    67   268   521    65    16
   FRA    66   118     0   177    56    91   178    48    14
   ITA   111   411   139     0    89   210   567    85    17
   NLD    33    64    45    71     0    56    82    32    12
   USA   141   237    62   152    42     0   223    31    18
   DEA    95   427   131   483    72   178     0    83    14
   SVN    27    63    46    82    31    26    77     0     8
   GBR    15    14    13    15    10    16    12     6     0
       ----------------------------------------------------------------------------

BSW
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
          CAN   CHE   FRA   NLD   USA   DEA   SVN   GBR   ITA
       ----------------------------------------------------------------------------
   CAN     0   129    76    41   151   103    29    18   116
   CHE   113     0   158    67   268   489    63    16   430
   FRA    66   118     0    56    91   168    47    14   164
   NLD    33    64    45     0    56    76    32    12    79
   USA   142   237    62    42     0   198    30    18   166
   DEA    87   396   123    70   150     0    81    13   473
   SVN    26    61    45    31    25    76     0     8    82
   GBR    15    14    13    10    16    12     6     0    17
   ITA   101   374   127    66   119   410    79    15     0
       ----------------------------------------------------------------------------

BSW
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
          CAN   CHE   FRA   ITA   NLD   USA   DEA   SVN   GBR
       ----------------------------------------------------------------------------
   CAN     0   129    76   128    41   151   114    29    18
   CHE   113     0   158   472    67   268   521    64    16
   FRA    66   118     0   177    56    91   178    47    14
   ITA   111   411   139     0    89   208   567    84    17
   NLD    33    64    45    71     0    56    82    32    12
   USA   142   237    62   151    42     0   223    30    18
   DEA    95   427   131   483    72   178     0    82    14
   SVN    26    62    45    81    31    25    76     0     8
   GBR    15    14    13    15    10    16    12     6     0
       ----------------------------------------------------------------------------

BSW
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
          CAN   CHE   FRA   ITA   NLD   DEA   SVN   USA
       ----------------------------------------------------------------------------
   CAN     0   129    76    85    29    81    29   151
   CHE   113     0   155   301    62   327    63   267
   FRA    66   115     0   116    49   126    47    91
```

```
   ITA    76   250    87     0    59   284    70   112
   NLD    25    62    40    55     0    63    31    36
   DEA    69   261    86   249    59     0    74   126
   SVN    26    61    45    68    31    67     0    29
   USA   142   237    62    79    28    89    25     0
       ------------------------------------------------------------------------
BSW
--------
  common bulls below diagonal
  common three quarter sib group above diagonal
         CAN   CHE   FRA   ITA   NLD   USA   DEA   SVN   GBR
       ------------------------------------------------------------------------

   CAN     0   121    66   128    41   151    81    23    18
   CHE   106     0   120   416    62   239   322    51    16
   FRA    60    90     0   143    46    76   115    36    14
   ITA   111   355   115     0    87   207   320    67    17
   NLD    33    61    40    71     0    56    64    24    12
   USA   142   204    55   152    42     0   126    23    18
   DEA    69   257    83   284    59    89     0    61    11
   SVN    21    48    36    63    24    20    57     0     6
   GBR    15    14    13    15    10    16    10     4     0
       ------------------------------------------------------------------------
BSW
--------
  common bulls below diagonal
  common three quarter sib group above diagonal
         CAN   CHE   FRA   ITA   NLD   USA   DEA   SVN   GBR
       ------------------------------------------------------------------------

   CAN     0   121    66   128    41   150   114    23    18
   CHE   106     0   120   417    62   239   466    51    16
   FRA    60    90     0   143    46    76   147    36    14
   ITA   111   357   115     0    89   210   560    67    17
   NLD    33    61    40    71     0    56    82    24    12
   USA   141   204    55   152    42     0   221    23    18
   DEA    94   378   109   479    72   174     0    64    14
   SVN    21    48    36    63    24    20    60     0     6
   GBR    15    14    13    15    10    16    12     4     0
       ------------------------------------------------------------------------
BSW
--------
  common bulls below diagonal
  common three quarter sib group above diagonal
         CAN   CHE   FRA   ITA   NLD   USA   DEA   SVN   GBR
       ------------------------------------------------------------------------

   CAN     0   121    66   124    41   151   114    23    18
   CHE   106     0   120   416    62   239   466    51    16
   FRA    60    90     0   142    46    76   147    36    14
   ITA   108   356   115     0    87   196   555    67    17
   NLD    33    61    40    70     0    56    82    24    12
   USA   142   204    55   138    42     0   221    23    18
   DEA    94   378   109   472    72   174     0    63    14
   SVN    21    48    36    63    24    20    59     0     6
   GBR    15    14    13    15    10    16    12     4     0
       ------------------------------------------------------------------------
BSW
--------
BSW
--------
BSW
--------
  common bulls below diagonal
  common three quarter sib group above diagonal
         CAN   CHE   DEA   ITA   SVN   USA   FRA
       ------------------------------------------------------------------------

   CAN     0   120   113    86    23   152    46
   CHE   105     0   460   301    51   238    95
   DEA    95   375     0   325    63   217   116
   ITA    77   249   274     0    60   112    96
   SVN    21    48    59    57     0    23    36
```

```
 USA  142  204  173   79   20    0   55
 FRA   40   67   82   73   36   36    0
------------------------------------------------------------------------------
BSW
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
       CAN  CHE  DEA  ITA  SVN  FRA
------------------------------------------------------------------------------
 CAN    0  127  115  129   30   77
 CHE  112    0  521  472   64  158
 DEA   95  427    0  565   82  178
 ITA  112  411  482    0   84  177
 SVN   27   63   76   82    0   48
 FRA   67  118  131  139   46    0
------------------------------------------------------------------------------
BSW
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
       CAN  CHE  DEA  ITA  SVN  USA  FRA
------------------------------------------------------------------------------
 CAN    0  120   91   86   23  152   46
 CHE  105    0  357  301   51  238   95
 DEA   79  288    0  291   62  154  108
 ITA   77  249  256    0   60  112   96
 SVN   21   48   58   57    0   23   36
 USA  142  204  113   79   20    0   55
 FRA   40   67   77   73   36   36    0
------------------------------------------------------------------------------
BSW
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
       CHE  DEA  ITA  SVN  USA  FRA
------------------------------------------------------------------------------
 CHE    0  503  301   51  267  156
 DEA  412    0  324   63  208  174
 ITA  250  273    0   60  112  116
 SVN   48   59   57    0   23   36
 USA  237  162   79   20    0   90
 FRA  117  129   87   36   62    0
------------------------------------------------------------------------------
BSW
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
       CAN  CHE  DEA  ITA  SVN  USA  FRA
------------------------------------------------------------------------------
 CAN    0   77   65   67   21   84   34
 CHE   66    0  357  301   47  238   95
 DEA   53  288    0  291   57  154  108
 ITA   60  249  256    0   53  112   96
 SVN   19   45   53   51    0   22   34
 USA   75  204  113   79   19    0   55
 FRA   28   67   77   73   34   36    0
------------------------------------------------------------------------------
BSW
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
       CAN  CHE  DEA  ITA  SVN  FRA
------------------------------------------------------------------------------
 CAN    0  127  115  125   29   77
 CHE  112    0  521  466   62  158
 DEA   95  427    0  559   81  178
 ITA  109  406  474    0   82  176
 SVN   26   61   75   80    0   47
 FRA   67  118  131  139   45    0
```

```
------------------------------------------------------------------------
BSW
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
        CHE  DEA  ITA  SVN  FRA
------------------------------------------------------------------------
 CHE    0  520  469   50  155
 DEA  426    0  565   64  177
 ITA  408  482    0   66  175
 SVN   48   60   63    0   36
 FRA  117  130  139   36    0
------------------------------------------------------------------------
BSW
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
        CHE  DEA  ITA  SVN  FRA
------------------------------------------------------------------------
 CHE    0  293  276   49  108
 DEA  246    0  282   62  125
 ITA  234  249    0   60  115
 SVN   47   58   57    0   36
 FRA   80   85   87   36    0
------------------------------------------------------------------------
BSW
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
        CHE  DEA  ITA  SVN  FRA
------------------------------------------------------------------------
 CHE    0  520  463   63  155
 DEA  426    0  559   82  177
 ITA  403  474    0   83  174
 SVN   62   76   81    0   47
 FRA  117  130  139   45    0
------------------------------------------------------------------------
BSW
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
        CHE  DEA  ITA  SVN  FRA
------------------------------------------------------------------------
 CHE    0  326  299   63   91
 DEA  260    0  283   74  104
 ITA  248  249    0   70   95
 SVN   62   67   68    0   39
 FRA   66   74   72   38    0
------------------------------------------------------------------------
GUE
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
        CAN  GBR  USA  AUS
------------------------------------------------------------------------
 CAN    0   22   63   19
 GBR   19    0   75   11
 USA   52   74    0   22
 AUS   19    9   19    0
------------------------------------------------------------------------
GUE
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
        CAN  GBR  USA  AUS
------------------------------------------------------------------------
 CAN    0   22   63   19
 GBR   19    0   75   11
 USA   52   74    0   22
```

```
  AUS    19     9    19     0
---------------------------------------------------------------------------
GUE
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
       CAN  GBR  USA  AUS
---------------------------------------------------------------------------
  CAN    0    22    63    19
  GBR   19     0    75    11
  USA   52    74     0    22
  AUS   19     9    19     0
---------------------------------------------------------------------------
GUE
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
       CAN  GBR  USA  AUS
---------------------------------------------------------------------------
  CAN    0    22    63    19
  GBR   19     0    75    11
  USA   52    74     0    22
  AUS   19     9    19     0
---------------------------------------------------------------------------
GUE
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
       CAN  GBR  USA  AUS
---------------------------------------------------------------------------
  CAN    0    22    63    19
  GBR   19     0    75    11
  USA   52    74     0    22
  AUS   19     9    19     0
---------------------------------------------------------------------------
GUE
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
       CAN  GBR  USA  AUS
---------------------------------------------------------------------------
  CAN    0    22    63    19
  GBR   19     0    75    11
  USA   52    74     0    22
  AUS   19     9    19     0
---------------------------------------------------------------------------
GUE
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
       CAN  GBR  USA  AUS
---------------------------------------------------------------------------
  CAN    0    22    63    19
  GBR   19     0    75    11
  USA   52    74     0    22
  AUS   19     9    19     0
---------------------------------------------------------------------------
GUE
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
       CAN  USA  AUS
---------------------------------------------------------------------------
  CAN    0    35    19
  USA   33     0     6
  AUS   19     4     0
---------------------------------------------------------------------------
GUE
--------
```

```
 common bulls below diagonal
 common three quarter sib group above diagonal
         CAN  GBR  USA  AUS
 -------------------------------------------------------------------------

  CAN    0   22   63   19
  GBR   19    0   75   11
  USA   52   74    0   22
  AUS   19    9   19    0
 -------------------------------------------------------------------------
GUE
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
         CAN  GBR  USA  AUS
 -------------------------------------------------------------------------

  CAN    0   22   63   19
  GBR   19    0   75   11
  USA   52   74    0   22
  AUS   19    9   19    0
 -------------------------------------------------------------------------
GUE
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
         CAN  GBR  USA  AUS
 -------------------------------------------------------------------------

  CAN    0   22   63   19
  GBR   19    0   75   11
  USA   52   74    0   22
  AUS   19    9   19    0
 -------------------------------------------------------------------------
GUE
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
         CAN  GBR  USA  AUS
 -------------------------------------------------------------------------

  CAN    0   22   63   19
  GBR   19    0   75   11
  USA   52   74    0   22
  AUS   19    9   19    0
 -------------------------------------------------------------------------
GUE
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
         CAN  GBR  USA  AUS
 -------------------------------------------------------------------------

  CAN    0   22   61   18
  GBR   19    0   75   11
  USA   51   74    0   22
  AUS   18    9   19    0
 -------------------------------------------------------------------------
GUE
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
         CAN  GBR  USA  AUS
 -------------------------------------------------------------------------

  CAN    0   22   63   19
  GBR   19    0   75   11
  USA   52   74    0   22
  AUS   19    9   19    0
 -------------------------------------------------------------------------
GUE
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
         CAN  GBR  USA  AUS
```

```
            ----------------------------------------------------------------------------
             CAN    0   22   63   19
             GBR   19    0   75   11
             USA   52   74    0   22
             AUS   19    9   19    0
            ----------------------------------------------------------------------------
GUE
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
         CAN  AUS  USA
            ----------------------------------------------------------------------------
             CAN    0   19   63
             AUS   19    0   22
             USA   52   19    0
            ----------------------------------------------------------------------------
GUE
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
         CAN  GBR  USA  AUS
            ----------------------------------------------------------------------------
             CAN    0   12   63   19
             GBR    9    0   33    9
             USA   52   31    0   21
             AUS   19    8   18    0
            ----------------------------------------------------------------------------
GUE
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
         CAN  GBR  USA  AUS
            ----------------------------------------------------------------------------
             CAN    0   20   61   18
             GBR   17    0   73   10
             USA   51   72    0   22
             AUS   18    8   19    0
            ----------------------------------------------------------------------------
GUE
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
         CAN  GBR  USA  AUS
            ----------------------------------------------------------------------------
             CAN    0   20   63   19
             GBR   17    0   73   10
             USA   52   72    0   22
             AUS   19    8   19    0
            ----------------------------------------------------------------------------
GUE
--------
GUE
--------
HOL
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
         AUS  BEL  CAN  CHE  DEU  DFS  ESP  FRA  GBR  ITA  NLD  USA  HUN  POL  NZL  ZAF  JPN  CZE  EST  IRL  KOR  SVN  PRT  LVA
            ----------------------------------------------------------------------------
     AUS    0  484  863  441  775  755  618  797  870  680  882 1051  463  556  486  306  553  530   90  415  311  126  479  230
     BEL  416    0  636  506  813  654  581  753  717  678 1013  747  412  561  275  247  420  521   90  396  258  156  496  231
     CAN  783  603    0  794 1762 1136 1277 1296 1529 1729 1301 3064  898 1107  359  375 1143 1054  150  438  658  192  855  456
     CHE  393  507  691    0  855  566  545  573  680  708  797  871  369  523  236  217  372  478   76  347  259  125  426  226
     DEU  425  686  720  629    0 1905 1308 1958 1617 2151 2224 2486  961 1546  405  356 1106 1493  207  534  505  292  883  619
     DFS  495  570  821  509  924    0  940 1412 1321 1307 1611 1638  728 1117  451  383  792 1055  159  535  432  214  764  410
     ESP  474  562  801  447  617  665    0 1096 1061 1277 1069 1500  709  898  314  367  838  858  129  412  475  180  730  372
     FRA  483  686  740  488  703  619  722    0 1395 1447 1754 2235  799 1335  477  356 1073 1127  142  525  474  175  742  381
     GBR  726  715 1542  676  849  907  861  781    0 1521 1612 2039  788 1103  467  394  875 1015  150  722  490  207  823  424
     ITA  550  670 1456  652 1136  998  948  736 1287    0 1557 2392  920 1331  339  350  995 1213  181  486  579  251  891  523
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 NLD  724 1108 1141  778 1292 1169  907  902 1340 1297    0 2146  801 1296  587  382  890 1342  190  658  454  241  870  453
 USA  869  637 3060  797  947 1005  978 1016 1857 1861 1695    0 1164 1552  529  466 1672 1517  198  566  817  221 1091  636
 HUN  329  334  793  309  576  518  548  470  637  776  604 1053    0  737  271  299  598  832  113  333  416  142  566  318
 POL  357  441  819  376  833  718  568  710  827  994  976 1276  564    0  306  290  738 1072  179  398  481  226  758  472
 NZL  388  212  306  198  251  287  256  233  364  270  520  444  203  188    0  205  309  324   44  331  175   63  281  130
 ZAF  280  210  348  191  255  301  339  251  366  310  344  494  257  215  186    0  307  301   52  237  229   75  315  135
 JPN  282  227  392  215  266  301  304  262  343  358  325  452  242  240  144  194    0  727  107  328  484  136  537  301
 CZE  335  384  712  348  890  607  584  640  716  893 1129 1122  704  727  209  224  219    0  140  397  464  206  693  405
 EST   43   54   67   35   99   80   56   51   69   91  114  121   66   95   19   21   25   77    0   66   74   54  104  107
 IRL  373  379  413  346  383  428  395  413  774  456  601  524  279  292  270  225  188  299   34    0  198  101  365  172
 KOR  219  179  599  185  252  289  334  239  368  487  306  923  324  346  120  177  225  323   29  138    0   99  413  244
 SVN   85  121  141   89  261  169  130  115  158  214  205  168  103  176   46   53   65  152   31   77   61    0  145  111
 PRT  363  498  859  383  609  650  698  588  756  858  861 1112  544  700  217  300  257  569   65  316  349  113    0  361
 LVA  103  128  264  112  431  229  186  149  239  356  282  529  217  318   66   80   86  251   57   99  140   60  283    0
      -----------------------------------------------------------------------------------------------------------------------
HOL
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common bulls below diagonal
common three quarter sib group above diagonal
      AUS  BEL  CAN  CHE  DEU  DFS  ESP  FRA  GBR  ITA  NLD  USA  HUN  POL  NZL  ZAF  JPN  CZE  EST  IRL  KOR  SVN  PRT  LVA
      -----------------------------------------------------------------------------------------------------------------------
 AUS    0  477  863  441  775  754  629  655  870  680  827 1051  463  554  486  256  551  530   89  415  310  126  482  208
 BEL  415    0  630  503  808  647  593  677  709  674  957  730  409  557  271  216  409  519   90  393  257  156  497  212
 CAN  783  603    0  794 1761 1136 1285 1120 1529 1729 1227 3064  898 1106  359  322 1139 1054  150  438  655  192  857  430
 CHE  393  506  691    0  855  566  553  535  680  708  778  871  369  522  236  196  370  478   76  347  258  125  427  207
 DEU  425  686  720  629    0 1905 1334 1822 1616 2151 2184 2486  961 1540  405  321 1103 1493  206  534  502  292  883  591
 DFS  495  569  821  509  924    0  962 1226 1319 1306 1532 1637  727 1112  450  329  790 1055  158  533  430  214  767  384
 ESP  483  587  809  457  650  687    0 1018 1082 1292 1059 1518  718  916  325  322  841  877  133  426  477  185  748  358
 FRA  437  639  681  458  630  586  716    0 1234 1395 1403 1788  745 1243  386  270  904 1070  181  465  435  174  703  353
 GBR  726  715 1542  676  849  907  890  727    0 1521 1545 2037  788 1101  467  338  872 1015  150  719  488  207  825  396
 ITA  550  670 1456  652 1136  998  973  720 1287    0 1536 2392  920 1331  339  336  992 1213  181  486  575  251  892  507
 NLD  692 1046 1084  754 1270 1145  907  770 1286 1281    0 1910  780 1272  561  319  817 1323  187  644  434  241  854  419
 USA  869  636 3060  797  947 1004  994  813 1857 1861 1451    0 1164 1550  529  397 1668 1517  198  564  812  221 1094  605
 HUN  329  334  793  309  576  518  557  453  637  776  587 1053    0  736  271  271  597  832  113  333  413  142  569  301
 POL  357  441  819  376  833  718  588  667  826  994  965 1276  564    0  306  264  736 1072  178  398  479  226  760  451
 NZL  388  212  306  198  251  287  264  204  364  270  499  444  203  188    0  168  309  324   44  331  174   63  282  112
 ZAF  240  193  306  175  236  277  300  211  315  303  285  409  240  207  149    0  260  280   51  200  209   75  299  120
 JPN  276  221  385  210  261  296  301  249  335  353  314  443  239  237  142  178    0  726  107  328  481  136  538  283
 CZE  335  384  712  348  890  607  607  605  716  893 1112 1122  704  727  209  212  217    0  140  397  463  206  695  390
 EST   43   54   67   35   99   80   60   51   69   91  113  121   66   95   19   21   25   77    0   66   74   54  104  101
 IRL  373  379  413  346  383  428  413  382  772  456  587  524  279  292  270  194  186  299   34    0  196  101  366  158
 KOR  219  179  598  185  252  289  337  231  367  486  295  916  322  345  120  161  222  323   29  138    0   99  412  234
 SVN   85  121  141   89  261  169  137  115  158  214  203  168  103  176   46   53   65  152   31   77   61    0  145  106
 PRT  364  500  861  383  609  652  718  580  759  858  848 1112  548  703  217  290  253  571   65  317  348  113    0  344
 LVA   93  117  250  102  409  215  182  141  221  344  260  508  204  306   56   72   81  243   52   89  138   57  271    0
      -----------------------------------------------------------------------------------------------------------------------
HOL
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common bulls below diagonal
common three quarter sib group above diagonal
      AUS  BEL  CAN  CHE  DEU  DFS  ESP  FRA  GBR  ITA  NLD  USA  HUN  POL  NZL  ZAF  JPN  CZE  EST  IRL  KOR  PRT  SVN  LVA
      -----------------------------------------------------------------------------------------------------------------------
 AUS    0  484  863  441  775  754  620  797  870  680  856 1051  463  556  486  306  552  530   90  415  310  482   99  230
 BEL  416    0  636  506  813  653  584  753  717  678  989  747  412  561  275  247  419  521   90  396  498  498  124  231
 CAN  783  603    0  794 1762 1136 1280 1296 1529 1728 1270 3064  898 1107  359  375 1141 1054  150  438  656  857  166  456
 CHE  393  507  691    0  855  566  546  574  680  708  791  871  369  523  236  217  371  478   76  347  258  427  100  226
 DEU  425  686  720  629    0 1905 1314 1959 1617 2151 2211 2486  961 1546  405  356 1105 1493  207  534  503  883  257  619
 DFS  495  570  821  509  924    0  943 1411 1320 1306 1569 1637  727 1116  450  383  791 1055  159  534  430  768  181  410
 ESP  475  565  802  449  624  668    0 1099 1063 1280 1058 1503  710  901  316  367  837  861  131  413  473  735  151  374
 FRA  483  686  740  489  704  619  726    0 1395 1447 1639 2235  799 1335  477  356 1072 1127  142  525  472  747  150  381
 GBR  726  715 1542  676  849  907  864  781    0 1521 1583 2038  788 1103  467  394  874 1015  150  720  489  827  173  424
 ITA  550  670 1456  652 1136  998  953  736 1287    0 1551 2391  920 1331  339  349  994 1213  181  486  577  892  221  523
 NLD  720 1084 1134  777 1290 1168  909  880 1328 1296    0 2018  792 1287  574  372  855 1337  189  651  447  867  201  448
 USA  869  637 3060  797  947 1004  980 1016 1857 1861 1653    0 1164 1552  529  465 1670 1517  198  565  814 1094  189  636
 HUN  329  334  793  309  576  518  549  470  637  776  604 1053    0  737  271  299  597  832  113  333  415  569  124  318
 POL  357  441  819  376  833  718  570  710  827  994  975 1276  564    0  306  290  737 1072  179  398  480  760  200  472
 NZL  388  212  306  198  251  287  257  233  364  270  518  444  203  188    0  205  309  324   44  331  174  282   52  130
 ZAF  280  210  348  191  255  301  340  251  366  309  342  493  257  215  186    0  307  301   52  237  228  314   56  135
 JPN  277  223  387  211  262  297  300  257  338  354  319  446  239  237  142  192    0  727  107  328  482  539  112  301
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   CZE   335  384  712  348  890  607  586  640  716  893 1128 1122  704  727  209  224  217    0  140  397  464  696  177  405
   EST    43   54   67   35   99   80   57   51   69   91  114  121   66   95   19   21   25   77    0   66   74  104   50  107
   IRL   373  379  413  346  383  428  396  413  772  456  598  524  279  292  270  225  186  299   34    0  197  366   78  172
   KOR   219  179  599  185  252  289  334  239  368  487  303  918  324  346  120  176  223  323   29  138    0  413   86  244
   PRT   364  499  861  383  609  652  703  592  758  858  860 1112  547  703  217  299  255  571   65  317  349    0  118  361
   SVN    68   94  124   74  235  143  110   99  132  188  172  146   89  156   39   40   50  132   27   63   54   93    0   95
   LVA   103  128  264  112  431  229  188  149  239  356  281  529  217  318   66   80   85  251   57   99  140  283   54    0
   ---------------------------------------------------------------------------------
HOL
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common bulls below diagonal
common three quarter sib group above diagonal
        AUS  BEL  CAN  CHE  DEU  DFS  ESP  FRA  GBR  ITA  NLD  USA  HUN  POL  ZAF  JPN  CZE  EST  IRL  KOR  PRT  SVN  LVA
   ---------------------------------------------------------------------------------
   AUS     0  470  863  425  773  754  633  655  867  679  466 1048  462  551  302  551  530   88  413  310  474   97  230
   BEL   413    0  622  478  797  638  590  673  696  671  608  715  403  550  235  404  516   89  386  252  487  122  231
   CAN   783  598    0  757 1760 1132 1289 1120 1527 1729  850 3064  898 1105  370 1139 1289  149  437  655  852  163  456
   CHE   389  482  661    0  771  551  546  528  666  687  533  815  360  501  213  368  455   73  343  256  411   96  221
   DEU   424  684  720  576    0 1893 1343 1821 1614 2150 1371 2482  958 1536  351 1102 1492  206  533  502  867  254  619
   DFS   495  567  821  499  923    0  965 1220 1308 1301  915 1627  723 1102  379  787 1053  157  532  430  753  178  409
   ESP   486  589  812  455  667  695    0 1025 1085 1298  714 1524  719  919  369  845  880  134  428  477  746  154  381
   FRA   437  639  681  453  630  586  729    0 1233 1395  818 1787  744 1241  300  904 1070  136  464  435  689  149  367
   GBR   726  706 1542  666  848  907  897  727    0 1520  911 2032  784 1092  388  871 1014  147  711  488  811  170  424
   ITA   550  670 1456  638 1135  998  981  720 1285    0 1110 2392  920 1327  345  992 1213  179  485  575  881  219  523
   NLD   439  659  848  504  957  839  631  585  866 1040    0 1054  497  927  206  447  918  149  367  298  550  190  343
   USA   868  628 3060  744  946 1004  997  813 1856 1861  939    0 1162 1548  460 1668 1516  197  561  811 1082  186  636
   HUN   329  332  793  304  576  518  561  453  636  776  392 1052    0  734  296  597  832  113  330  413  563  123  318
   POL   357  438  819  356  833  716  596  667  823  994  795 1276  564    0  285  736 1069  178  395  479  751  198  472
   ZAF   277  207  345  187  252  298  339  217  363  306  184  489  255  212    0  303  296   49  234  225  309   53  133
   JPN   276  221  385  210  261  296  302  249  335  353  241  443  239  237  189    0  726  107  327  481  536  111  301
   CZE   335  384  712  336  890  607  611  605  716  893  881 1122  704  727  220  217    0  138  396  463  688  175  405
   EST    43   54   67   35   99   80   62   51   69   91   96  121   66   95   21   25   77    0   64   74  102   50  106
   IRL   373  377  413  342  382  428  417  382  765  456  367  524  279  291  223  186  299   34    0  196  359   77  172
   KOR   219  179  598  184  252  289  337  231  367  486  221  915  322  345  175  222  323   29  138    0  412   86  244
   PRT   364  496  861  373  608  649  719  580  757  857  561 1112  547  697  297  253  571   64  317  348    0  118  358
   SVN    67   94  123   73  233  142  114   99  131  187  171  145   89  156   37   50  132   27   63   54   93    0   94
   LVA   103  128  264  110  431  229  203  147  239  356  222  529  217  318   79   85  251   57   99  140  283   54    0
   ---------------------------------------------------------------------------------
HOL
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common bulls below diagonal
common three quarter sib group above diagonal
        AUS  BEL  CAN  CHE  DEU  DFS  ESP  FRA  GBR  ITA  NLD  USA  HUN  POL  NZL  ZAF  JPN  CZE  EST  IRL  KOR  SVN  PRT  LVA
   ---------------------------------------------------------------------------------
   AUS     0  484  863  441  775  755  617  797  870  680  882 1051  463  556  486  306  553  530   90  415  311  127  482  230
   BEL   416    0  636  506  813  654  577  753  717  678 1013  747  412  561  275  247  420  521   90  396  258  157  497  231
   CAN   783  603    0  794 1762 1136 1274 1296 1529 1728 1301 3064  898 1107  359  375 1142 1054  150  438  658  193  857  456
   CHE   393  507  691    0  855  566  544  573  680  708  797  871  369  523  236  217  372  478   76  347  259  126  427  226
   DEU   425  686  720  629    0 1905 1301 1958 1617 2151 2224 2486  961 1546  405  356 1106 1493  207  534  505  293  883  619
   DFS   495  570  821  509  924    0  934 1412 1321 1307 1611 1638  728 1117  451  383  792 1055  159  535  432  215  767  410
   ESP   473  558  798  445  609  659    0 1091 1055 1271 1063 1494  708  895  312  367  834  856  129  411  474  181  731  371
   FRA   483  686  740  488  703  618  716    0 1395 1447 1754 2235  799 1335  477  356 1073 1127  142  525  474  176  746  381
   GBR   726  715 1542  676  849  907  854  781    0 1521 1612 2039  788 1103  467  394  875 1015  150  722  490  208  827  424
   ITA   550  670 1456  652 1136  998  941  736 1287    0 1557 2391  920 1331  339  350  995 1213  181  486  579  252  892  523
   NLD   724 1108 1141  778 1292 1169  900  902 1340 1297    0 2146  801 1296  587  382  890 1342  190  658  454  242  871  453
   USA   869  637 3060  797  947 1004  972 1016 1857 1861 1695    0 1164 1552  529  466 1671 1517  198  566  817  222 1093  636
   HUN   329  334  793  309  576  518  548  470  637  776  604 1053    0  737  271  299  598  832  113  333  416  143  568  318
   POL   357  441  819  376  833  718  564  710  827  994  976 1276  564    0  306  290  738 1072  179  398  481  227  759  472
   NZL   388  212  306  198  251  287  254  233  364  270  520  444  203  188    0  205  309  324   44  331  175   63  282  130
   ZAF   280  210  348  191  255  301  339  251  366  310  344  494  257  215  186    0  307  301   52  237  229   76  315  135
   JPN   280  225  389  213  264  299  302  260  341  356  323  449  241  238  143  193    0  727  107  328  483  137  539  301
   CZE   335  384  712  348  890  607  582  640  716  893 1129 1122  704  727  209  224  219    0  140  397  464  207  695  405
   EST    43   54   67   35   99   80   56   51   69   91  114  121   66   95   19   21   25   77    0   66   74   54  104  107
   IRL   373  379  413  346  383  428  394  413  774  456  601  524  279  292  270  225  187  299   34    0  198  102  366  172
   KOR   219  179  599  185  252  289  332  239  368  487  306  923  324  346  120  177  223  323   29  138    0  100  413  244
   SVN    86  122  142   90  262  170  131  116  159  215  206  169  104  177   46   53   66  153   31   78   62    0  146  112
   PRT   364  498  861  383  609  651  697  591  758  858  862 1112  546  702  217  300  256  570   65  317  349  113    0  361
   LVA   103  128  264  112  431  229  184  149  239  356  282  529  217  318   66   80   85  251   57   99  140   60  283    0
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HOL
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common bulls below diagonal
common three quarter sib group above diagonal
     AUS  BEL  CAN  CHE  DEU  DFS  ESP  FRA  GBR  ITA  NLD  USA  HUN  POL  NZL  ZAF  JPN  CZE  EST  IRL  KOR  PRT  SVN  LVA
    -------------------------------------------------------------------------------------------------------------------------
 AUS    0  459  863  441  775  755  617  797  870  680  880 1051  463  556  486  306  358  530   90  415  309  482   99  230
 BEL  413    0  616  499  793  633  561  706  686  671  924  700  397  549  260  235  310  507   90  381  248  490  124  230
 CAN  783  593    0  794 1762 1136 1276 1296 1529 1728 1298 3064  898 1107  359  375  840 1054  150  438  655  857  166  456
 CHE  393  503  691    0  855  566  544  574  680  708  797  871  369  523  236  217  309  478   76  347  502  427  100  226
 DEU  425  681  720  629    0 1905 1303 1959 1617 2151 2222 2486  961 1546  405  356  881 1493  207  534  502  883  257  619
 DFS  495  565  821  509  924    0  937 1412 1321 1307 1603 1638  728 1117  451  383  564 1055  159  535  429  768  181  410
 ESP  473  553  801  445  612  662    0 1093 1058 1274 1062 1497  709  896  313  367  655  857  129  411  472  732  151  371
 FRA  483  674  740  489  704  619  720    0 1395 1447 1743 2235  799 1335  477  356  736 1127  142  525  471  747  150  381
 GBR  726  698 1542  676  849  907  858  781    0 1521 1609 2039  788 1103  467  394  634 1015  150  722  488  827  173  424
 ITA  550  670 1456  652 1136  998  945  736 1287    0 1557 2391  920 1331  339  350  872 1213  181  486  576  892  221  523
 NLD  724 1011 1141  778 1291 1169  902  903 1339 1297    0 2139  801 1295  586  382  644 1342  189  657  449  872  201  452
 USA  869  622 3060  797  947 1004  976 1016 1857 1861 1692    0 1164 1552  529  466 1150 1517  198  566  812 1094  189  636
 HUN  329  330  793  309  576  518  548  470  637  776  604 1053    0  737  271  299  480  832  113  333  414  569  124  318
 POL  357  438  819  376  833  718  566  710  827  994  976 1276  564    0  306  290  634 1072  179  398  479  760  200  472
 NZL  388  206  306  198  251  287  256  233  364  270  520  444  203  188    0  205  196  324   44  331  173  282   52  130
 ZAF  279  207  347  190  254  300  338  250  365  309  343  493  256  214  186    0  209  301   52  237  227  315   56  135
 JPN  240  197  349  194  242  269  259  229  292  331  280  390  213  228  119  148    0  584   95  240  397  425  109  261
 CZE  335  381  712  348  890  607  583  640  716  893 1129 1122  704  727  209  224  200    0  140  397  463  696  177  405
 EST   43   54   67   35   99   80   56   51   69   91  114  121   66   95   19   21   25   77    0   66   74  104   50  107
 IRL  373  373  413  346  383  428  394  413  774  456  601  524  279  224  163  299   34    0  196  366   78  172
 KOR  219  179  599  185  252  289  334  239  368  487  306  919  324  346  120  176  208  323   29  138    0  412   86  243
 PRT  364  496  861  383  609  652  699  592  758  858  863 1112  547  703  217  299  226  571   65  317  349    0  118  361
 SVN   68   94  124   74  235  143  109   99  132  188  172  146   89  156   39   40   50  132   27   63   54   93    0   95
 LVA  103  128  264  112  431  229  184  149  239  356  282  529  217  318   66   80   81  251   57   99  140  283   54    0
    -------------------------------------------------------------------------------------------------------------------------
HOL
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common bulls below diagonal
common three quarter sib group above diagonal
     AUS  BEL  CAN  CHE  DEU  DFS  ESP  FRA  GBR  ITA  NLD  USA  HUN  POL  NZL  ZAF  JPN  CZE  EST  IRL  KOR  SVN  PRT  LVA
    -------------------------------------------------------------------------------------------------------------------------
 AUS    0  484  863  441  775  755  621  797  870  680  882 1051  463  556  486  306  551  530   90  415  310  127  483  230
 BEL  416    0  636  506  813  654  584  753  717  678 1013  747  412  561  275  247  417  521   90  396  257  157  498  231
 CAN  783  603    0  794 1762 1136 1280 1296 1529 1728 1301 3064  898 1107  359  375 1139 1054  150  438  655  193  859  456
 CHE  393  507  691    0  855  566  546  573  680  708  797  871  369  523  236  217  370  478   76  347  258  126  428  226
 DEU  425  686  720  629    0 1905 1316 1958 1617 2151 2224 2486  961 1546  405  356 1103 1493  207  534  502  293  885  619
 DFS  495  570  821  509  924    0  946 1412 1321 1307 1611 1638  728 1117  451  383  790 1055  159  535  430  215  770  410
 ESP  476  566  802  450  627  670    0 1100 1065 1280 1074 1503  710  902  317  368  836  862  131  414  473  182  737  375
 FRA  483  686  740  488  703  619  728    0 1395 1447 1754 2235  799 1335  477  356 1070 1127  142  525  470  176  749  381
 GBR  726  715 1542  676  849  907  866  781    0 1521 1612 2039  788 1103  467  394  872 1015  150  722  488  208  828  424
 ITA  550  670 1456  652 1136  998  954  736 1287    0 1557 2391  920 1331  339  350  992 1213  181  486  575  252  894  523
 NLD  724 1108 1141  778 1292 1169  913  902 1340 1297    0 2146  801 1296  587  382  887 1342  190  658  449  242  874  453
 USA  869  637 3060  797  947 1005  981 1016 1857 1861 1695    0 1164 1552  529  466 1668 1517  198  566  811  222 1096  636
 HUN  329  334  793  309  576  518  550  470  637  776  604 1053    0  737  271  299  597  832  113  333  413  143  571  318
 POL  357  441  819  376  833  718  571  710  827  994  976 1276  564    0  306  290  737 1072  179  398  479  227  762  472
 NZL  388  212  306  198  251  287  258  233  364  270  520  444  203  188    0  205  309  324   44  331  174   63  282  130
 ZAF  280  210  348  191  255  301  341  251  366  310  344  494  257  215  186    0  306  301   52  237  228   76  315  135
 JPN  276  221  385  210  261  296  298  255  335  353  317  443  239  237  142  190    0  726  107  328  481  137  540  301
 CZE  335  384  712  348  890  607  588  640  716  893 1129 1122  704  727  209  224  217    0  140  397  463  207  696  405
 EST   43   54   67   35   99   80   57   51   69   91  114  121   66   95   19   21   25   77    0   66   74   54  104  107
 IRL  373  379  413  346  383  428  397  413  774  456  601  524  279  292  270  225  186  299   34    0  196  102  366  172
 KOR  219  179  598  185  252  289  333  237  367  486  304  915  322  345  120  176  222  323   29  138    0  100  411  244
 SVN   86  122  142   90  262  170  133  116  159  215  206  169  104  177   46   53   66  153   31   78   62    0  147  112
 PRT  364  500  862  383  609  653  707  592  760  861  865 1116  551  705  217  300  253  572   65  317  349  114    0  361
 LVA  103  128  264  112  431  229  189  149  239  356  282  529  217  318   66   80   85  251   57   99  140   60  284    0
    -------------------------------------------------------------------------------------------------------------------------
HOL
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common bulls below diagonal
common three quarter sib group above diagonal
     AUS  BEL  CAN  CHE  DEU  DFS  ESP  FRA  GBR  ITA  NLD  USA  HUN  POL  ZAF  JPN  CZE  EST  IRL  KOR  SVN  PRT  LVA
    -------------------------------------------------------------------------------------------------------------------------
 AUS    0  439  781  441  774  754  619  528  867  679  789 1050  461  517  258  513  414   89  400  227  124  480  208
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   BEL   407    0  587  488  769  604  551  585  656  662  865  669  387  517  207  374  430   87  358  203  153  481  210
   CAN   730  582    0  771 1701 1040 1212  971 1435 1710 1163 2870  876 1056  312 1017  920  147  408  553  189  843  428
   CHE   393  493  676    0  855  565  548  499  680  708  769  871  367  505  197  363  411   76  340  212  122  425  207
   DEU   425  664  718  629    0 1904 1320 1614 1615 2150 2162 2485  957 1511  323 1077 1297  206  518  438  289  884  592
   DFS   495  556  818  509  924    0  942 1013 1315 1304 1495 1636  723 1064  331  747  865  158  508  345  213  764  384
   ESP   478  553  791  451  633  675    0  892 1064 1284 1023 1503  711  873  323  802  757  130  403  396  182  741  356
   FRA   380  556  613  424  593  531  630    0 1025 1287 1206 1446  664 1169  229  751  891  127  382  355  167  624  331
   GBR   725  678 1469  675  849  905  873  627    0 1518 1496 2031  785 1057  340  825  859  149  677  403  204  822  397
   ITA   550  665 1453  652 1136  998  959  675 1286    0 1532 2390  917 1313  335  982 1126  181  479  515  249  891  507
   NLD   665  949 1064  749 1271 1140  877  709 1262 1285    0 1815  763 1222  315  785 1171  187  595  364  238  846  419
   USA   869  612 2947  797  947 1004  984  682 1856 1861 1418    0 1161 1500  399 1536 1308  198  538  679  218 1090  605
   HUN   329  321  787  309  576  518  552  410  636  776  590 1053    0  710  272  582  716  113  319  358  140  571  301
   POL   343  424  798  363  817  695  548  661  804  986  941 1246  546    0  251  701  968  177  361  431  223  741  452
   ZAF   243  192  305  176  237  278  301  177  318  303  286  411  241  199    0  253  239   51  197  164   74  298  120
   JPN   271  219  382  209  260  294  293  226  330  352  310  435  237  230  178    0  615  105  301  394  136  533  281
   CZE   283  328  636  292  786  527  491  495  604  829 1017  970  595  671  176  201    0  133  316  392  197  623  376
   EST    43   53   67   35   99   80   57   47   69   91  113  121   66   94   21   25   72    0   64   69   54  104  101
   IRL   371  364  410  343  381  426  399  324  740  454  571  518  277  279  195  185  244   34    0  143  100  352  154
   KOR   159  155  510  159  221  246  270  211  293  433  249  762  273  322  119  188  278   27  104    0   90  354  218
   SVN    84  118  140   88  259  169  133  111  157  212  202  167  102  175   53   65  148   31   77   58    0  145  106
   PRT   361  491  843  381  610  651  711  535  757  861  844 1113  551  693  289  251  512   65  314  303  114    0  344
   LVA    93  117  250  102  410  215  178  136  221  344  261  508  204  306   72   81  238   52   89  128   57  271    0
  ----------------------------------------------------------------------------------
HOL
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common bulls below diagonal
common three quarter sib group above diagonal
        AUS  BEL  CAN  CHE  DEU  DFS  ESP  FRA  GBR  ITA  NLD  USA  HUN  POL  ZAF  JPN  CZE  EST  IRL  KOR  SVN  PRT  LVA
  ----------------------------------------------------------------------------------
   AUS     0  457  863  441  523  754  629  792  870  680  846 1051  462  555  306  551  530   90  414  309  126  489  230
   BEL   413    0  614  498  624  629  576  698  684  670  917  699  397  548  235  395  507   90  380  249  157  495  229
   CAN   783  593    0  794 1388 1136 1285 1280 1529 1728 1256 3064  897 1105  375 1139 1054  150  438  654  192  865  456
   CHE   393  503  691    0  695  566  552  569  680  706  787  871  369  521  217  370  477   76  347  258  125  433  226
   DEU   350  560  641  515    0 1315 1066 1361 1182 1821 1637 1809  737 1276  238  802 1134  181  377  412  270  685  564
   DFS   495  565  821  509  787    0  961 1384 1319 1305 1556 1636  726 1114  383  790 1055  159  534  430  214  775  410
   ESP   483  578  809  456  515  686    0 1106 1081 1291 1071 1518  717  913  372  840  875  133  425  476  184  756  379
   FRA   482  669  740  488  546  618  757    0 1380 1447 1584 2194  796 1326  355 1056 1122  140  519  465  175  754  380
   GBR   726  698 1542  676  692  907  889  781    0 1521 1567 2036  787 1099  393  871 1015  150  716  488  207  832  424
   ITA   550  670 1456  651 1002  998  972  736 1287    0 1543 2391  920 1330  350  992 1213  181  486  574  251  896  523
   NLD   715 1008 1128  776 1056 1166  931  860 1319 1295    0 1975  785 1273  370  846 1332  189  644  443  241  870  447
   USA   869  622 3060  797  776 1004  994  980 1857 1861 1637    0 1163 1548  466 1667 1517  198  564  809  221 1101  636
   HUN   329  330  793  309  454  517  557  470  637  776  602 1053    0  736  298  597  831  113  332  412  142  574  318
   POL   357  438  819  375  737  717  585  710  826  994  968 1276  563    0  289  737 1069  177  396  477  225  765  471
   ZAF   280  208  348  191  174  301  343  251  366  310  338  494  257  215    0  305  301   52  237  228   76  320  135
   JPN   276  220  384  209  227  295  299  253  333  352  313  441  238  236  189    0  726  107  328  480  136  545  301
   CZE   335  381  712  348  716  607  605  640  716  893 1127 1122  704  727  224  216    0  139  397  462  206  699  405
   EST    43   54   67   35   86   80   59   51   69   91  114  121   66   94   21   25   77    0   66   74   54  103  107
   IRL   373  373  413  346  298  428  412  413  768  456  597  524  279  292  225  186  299   34    0  196  101  367  172
   KOR   218  179  597  185  225  289  334  236  367  485  300  909  321  344  176  220  322   29  138    0   99  414  243
   SVN    86  122  142   90  251  169  137  116  159  215  206  169  104  176   53   66  153   31   78   61    0  146  112
   PRT   367  502  867  388  515  658  727  596  766  863  865 1122  554  708  301  252  576   64  318  349  114    0  363
   LVA   103  128  264  112  409  229  196  149  239  356  281  529  217  318   80   85  251   57   99  139   60  285    0
  ----------------------------------------------------------------------------------
HOL
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common bulls below diagonal
common three quarter sib group above diagonal
        AUS  BEL  CAN  CHE  DEU  DFS  ESP  FRA  GBR  ITA  NLD  USA  HUN  POL  NZL  ZAF  JPN  CZE  EST  IRL  KOR  SVN  PRT  LVA
  ----------------------------------------------------------------------------------
   AUS     0  477  863  441  775  754  629  746  870  680  827 1051  463  555  486  306  551  530   90  415  310  124  483  230
   BEL   415    0  632  505  809  649  594  728  711  676  959  732  409  558  271  245  410  519   90  394  257  154  498  231
   CAN   783  603    0  794 1761 1136 1285 1218 1529 1729 1227 3064  898 1107  359  375 1139 1054  150  438  657  190  859  456
   CHE   393  506  691    0  855  566  552  570  680  708  778  871  369  523  236  217  370  478   76  347  258  124  428  226
   DEU   425  686  720  629    0 1905 1333 1940 1617 2151 2185 2486  961 1545  405  356 1103 1493  207  534  504  290  885  619
   DFS   495  569  821  509  924    0  961 1333 1320 1306 1532 1637  727 1116  450  383  790 1055  159  534  431  212  770  410
   ESP   483  586  809  456  649  686    0 1080 1082 1291 1058 1518  718  915  325  372  841  875  133  425  478  183  748  379
   FRA   481  682  737  488  702  616  757    0 1340 1441 1549 2035  785 1324  444  341  992 1115  140  507  455  174  741  376
   GBR   726  715 1542  676  849  907  889  776    0 1521 1546 2038  788 1103  467  393  872 1015  150  720  489  205  828  424
   ITA   550  670 1456  652 1136  998  972  735 1287    0 1536 2392  920 1331  339  350  992 1213  181  486  578  249  894  523
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   NLD  692 1046 1085  754 1270 1144  905  849 1287 1281    0 1912  780 1274  561  363  817 1323  187  644  436  239  856  443
   USA  869  636 3060  797  947 1005  994  945 1857 1861 1451    0 1164 1552  529  466 1668 1517  198  565  815  219 1096  636
   HUN  329  334  793  309  576  518  557  469  637  776  587 1053    0  737  271  299  597  832  113  333  416  141  571  318
   POL  357  441  819  376  833  718  586  710  827  994  967 1276  564    0  306  290  737 1072  179  398  481  224  762  472
   NZL  388  212  306  198  251  287  264  231  364  270  499  444  203  188    0  205  309  324   44  331  174   63  282  130
   ZAF  280  210  348  191  255  301  343  249  366  310  324  494  257  215  186    0  306  301   52  237  228   75  315  135
   JPN  276  221  385  210  261  296  301  255  335  353  314  443  239  237  142  190    0  726  107  328  481  135  540  301
   CZE  335  384  712  348  890  607  605  638  716  893 1112 1122  704  727  209  224  217    0  140  397  464  205  696  405
   EST   43   54   67   35   99   80   59   51   69   91  113  121   66   95   19   21   25   77    0   66   74   54  104  107
   IRL  373  379  413  346  383  428  412  411  772  456  586  524  279  292  270  225  186  299   34    0  197  100  366  172
   KOR  219  179  599  185  252  289  337  238  368  487  296  919  324  346  120  176  222  323   29  138    0   99  413  244
   SVN   84  121  140   89  260  169  136  115  157  213  203  167  103  176   46   53   65  152   31   77   61    0  146  110
   PRT  364  500  862  383  609  653  718  590  759  860  849 1114  550  705  217  300  253  571   65  317  349  114    0  361
   LVA  103  128  264  112  431  229  196  149  239  356  278  529  217  318   66   80   85  251   57   99  140   60  283    0
       --------------------------------------------------------------------------------
HOL
--------
common bulls below diagonal
common three quarter sib group above diagonal
        AUS  BEL  CAN  CHE  DEU  DFS  ESP  FRA  GBR  ITA  NLD  USA  HUN  POL  NZL  ZAF  JPN  CZE  EST  IRL  KOR  SVN  PRT  LVA
       --------------------------------------------------------------------------------
   AUS    0  477  863  441  775  708  622  793  870  680  856 1051  463  556  486  306  552  530   90  415  310  126  481  230
   BEL  415    0  632  505  809  638  583  739  711  676  974  732  409  558  271  245  411  519   90  394  257  156  497  231
   CAN  783  603    0  794 1762 1058 1281 1281 1529 1729 1270 3064  898 1107  359  375 1140 1054  150  438  657  192  855  456
   CHE  393  506  691    0  855  562  548  573  680  708  791  871  369  523  236  217  370  478   76  347  258  125  427  226
   DEU  425  686  720  629    0 1852 1318 1954 1617 2151 2211 2486  961 1546  405  356 1104 1493  207  534  504  292  881  619
   DFS  495  569  821  509  924    0  905 1302 1262 1298 1535 1544  711 1096  423  356  737 1021  157  517  418  214  758  406
   ESP  476  567  803  451  628  671    0 1090 1067 1281 1061 1505  711  904  318  370  838  863  131  415  475  181  735  376
   FRA  483  685  740  488  702  618  730    0 1382 1447 1632 2196  797 1332  473  355 1058 1122  141  520  469  175  743  380
   GBR  726  714 1541  676  848  906  865  780    0 1521 1583 2038  788 1103  467  394  873 1015  150  720  489  207  825  424
   ITA  550  670 1456  652 1136  997  955  736 1286    0 1551 2392  920 1331  339  350  993 1213  181  486  578  251  891  523
   NLD  720 1078 1134  777 1290 1168  912  878 1327 1296    0 2018  792 1287  574  372  854 1337  189  651  448  241  866  448
   USA  869  636 3060  797  947 1004  982  981 1857 1861 1653    0 1164 1552  529  466 1669 1517  198  565  816  221 1092  636
   HUN  329  334  793  309  576  518  551  470  637  776  604 1053    0  737  271  299  597  832  113  333  416  142  569  318
   POL  357  441  819  376  833  718  573  710  827  994  975 1276  564    0  306  290  737 1072  179  398  481  226  758  472
   NZL  388  212  306  198  251  287  258  233  364  270  518  444  203  188    0  205  309  324   44  331  174   63  282  130
   ZAF  280  210  348  191  255  301  342  251  366  310  342  494  257  215  186    0  307  301   52  237  228   75  314  135
   JPN  276  222  386  210  262  297  300  256  336  354  317  444  239  237  142  191    0  727  107  328  482  136  539  301
   CZE  335  384  712  348  890  607  589  640  716  893 1128 1122  704  727  209  224  217    0  140  397  464  206  695  405
   EST   43   54   67   35   99   80   57   51   69   91  114  121   66   95   19   21   25   77    0   66   74   54  103  107
   IRL  373  379  413  346  383  428  398  413  772  456  598  524  279  292  270  225  186  299   34    0  197  101  366  172
   KOR  219  179  599  185  252  289  335  239  368  487  303  920  324  346  120  177  223  323   29  138    0   99  413  244
   SVN   85  121  141   89  261  169  132  115  158  214  205  168  103  176   46   53   65  152   31   77   61    0  145  111
   PRT  364  499  861  383  609  649  705  592  758  858  860 1112  547  703  217  300  254  571   65  317  349  113    0  361
   LVA  103  128  264  112  431  229  190  149  239  356  281  529  217  318   66   80   85  251   57   99  140   60  283    0
       --------------------------------------------------------------------------------
HOL
--------
common bulls below diagonal
common three quarter sib group above diagonal
        AUS  BEL  CAN  CHE  DEU  DFS  ESP  FRA  GBR  ITA  NLD  USA  HUN  POL  NZL  ZAF  JPN  CZE  EST  IRL  KOR  SVN  PRT  LVA
       --------------------------------------------------------------------------------
   AUS    0  477  863  441  775  755  633  797  870  680  882 1051  463  556  486  306  551  530   90  415  309  127  483  230
   BEL  415    0  632  505  809  650  597  742  711  676  982  732  409  558  271  245  410  519   90  394  256  157  499  231
   CAN  783  603    0  794 1762 1136 1289 1296 1529 1728 1301 3064  898 1107  359  375 1139 1054  150  438  654  193  859  456
   CHE  393  506  691    0  855  566  554  573  680  708  797  871  369  523  236  217  370  478   76  347  258  126  428  226
   DEU  425  686  720  629    0 1905 1343 1958 1617 2151 2224 2486  961 1546  405  356 1103 1493  207  534  501  293  885  619
   DFS  495  569  822  509  924    0  968 1412 1321 1307 1611 1638  728 1117  451  383  790 1055  159  535  429  215  770  410
   ESP  485  590  812  458  665  694    0 1126 1088 1298 1105 1524  720  923  328  372  845  880  135  429  476  186  753  381
   FRA  483  685  740  488  703  619  772    0 1395 1447 1754 2235  799 1335  477  356 1070 1127  142  525  469  176  749  381
   GBR  726  715 1542  676  849  907  897  781    0 1521 1612 2039  788 1103  467  394  872 1015  150  722  487  208  828  424
   ITA  550  670 1456  652 1136  998  981  736 1287    0 1557 2391  920 1331  339  350  992 1213  181  486  574  252  894  523
   NLD  724 1085 1141  778 1292 1169  950  902 1340 1297    0 2146  801 1296  587  382  887 1342  190  658  448  242  874  453
   USA  869  636 3060  797  947 1006  997 1016 1857 1861 1695    0 1164 1552  529  466 1668 1517  198  566  809  222 1096  636
   HUN  329  334  793  309  576  519  560  470  637  776  604 1053    0  737  271  299  597  832  113  333  412  143  571  318
   POL  357  441  819  376  833  718  595  710  827  994  976 1276  564    0  306  290  737 1072  179  398  478  227  762  472
   NZL  388  212  306  198  251  287  266  233  364  270  520  444  203  188    0  205  309  324   44  331  174   63  282  130
   ZAF  280  210  348  191  255  302  343  251  366  310  344  494  257  215  186    0  306  301   52  237  228   76  315  135
   JPN  276  221  385  210  261  296  302  255  335  353  317  443  239  237  142  190    0  726  107  328  480  137  540  301
```

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    CZE  335  384  712  348  890  607  609  640  716  893 1129 1122  704  727  209  224  217    0  140  397  462  207  696  405
    EST   43   54   67   35   99   80   61   51   69   91  114  121   66   95   19   21   25   77    0   66   74   54  104  107
    IRL  373  379  413  346  383  428  416  413  774  456  601  524  279  292  270  225  186  299   34    0  196  102  366  172
    KOR  219  179  597  185  252  289  335  237  366  485  303  913  321  344  120  176  222  323   29  138    0  100  411  244
    SVN   86  122  142   90  262  170  138  116  159  215  206  169  104  177   46   53   66  153   31   78   62    0  147  112
    PRT  364  500  862  383  609  653  722  592  760  861  865 1116  551  705  217  300  253  572   65  317  349  114    0  361
    LVA  103  128  264  112  431  229  203  149  239  356  282  529  217  318   66   80   85  251   57   99  140   60  284    0
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HOL
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common bulls below diagonal
common three quarter sib group above diagonal

	AUS	BEL	CAN	CHE	DEU	DFS	ESP	FRA	GBR	ITA	NLD	USA	HUN	POL	ZAF	JPN	CZE	EST	IRL	KOR	SVN	PRT	LVA
AUS	0	480	863	441	775	754	619	797	870	680	882	1051	463	556	306	553	530	90	414	310	127	482	230
BEL	414	0	632	504	807	648	581	746	711	677	1005	741	409	558	244	416	519	90	391	254	157	497	231
CAN	783	599	0	794	1762	1135	1279	1296	1529	1729	1301	3064	898	1107	375	1142	1054	150	438	656	193	857	456
CHE	393	505	691	0	855	565	545	573	680	708	797	871	369	523	217	372	478	76	347	258	126	427	226
DEU	425	685	720	629	0	1904	1309	1958	1617	2151	2224	2486	961	1546	356	1106	1493	207	534	503	293	883	619
DFS	494	568	822	508	923	0	942	1412	1320	1306	1610	1637	728	1116	383	792	1055	159	535	430	215	768	410
ESP	474	561	801	447	619	666	0	1096	1063	1278	1071	1500	710	900	367	838	860	131	413	473	181	735	374
FRA	483	684	740	488	703	619	722	0	1395	1447	1754	2235	799	1335	356	1073	1127	142	525	472	176	747	381
GBR	726	711	1542	676	849	907	862	781	0	1521	1612	2039	788	1103	394	875	1015	150	719	489	208	827	424
ITA	550	670	1456	652	1136	998	949	736	1287	0	1557	2392	920	1331	350	995	1213	181	486	577	252	892	523
NLD	724	1097	1141	778	1292	1168	908	902	1340	1297	0	2146	801	1296	382	890	1342	190	658	451	242	872	453
USA	869	633	3060	797	947	1006	978	1016	1857	1861	1695	0	1164	1552	466	1671	1517	198	566	814	222	1094	636
HUN	329	333	793	309	576	519	549	470	637	776	604	1053	0	737	299	598	832	113	333	415	143	569	318
POL	357	441	819	376	833	718	569	710	827	994	976	1276	564	0	290	738	1072	179	398	480	227	760	472
ZAF	280	210	348	191	255	302	339	251	366	310	344	494	257	215	0	307	301	52	237	228	76	315	135
JPN	280	225	389	213	264	299	302	260	341	356	323	449	241	238	193	0	727	107	328	482	137	539	301
CZE	335	384	712	348	890	607	585	640	716	893	1129	1122	704	727	224	219	0	140	397	464	207	696	405
EST	43	54	67	35	99	80	57	51	69	91	114	121	66	95	21	25	77	0	66	74	54	104	107
IRL	373	378	413	346	383	428	395	413	771	456	601	524	279	292	225	187	299	34	0	197	102	366	172
KOR	219	179	599	185	252	289	334	239	368	487	306	920	324	346	177	223	323	29	138	0	100	413	244
SVN	86	122	142	90	262	170	131	116	159	215	206	169	104	177	53	66	153	31	78	62	0	146	112
PRT	364	498	861	383	609	652	702	592	758	858	863	1112	547	703	300	256	571	65	317	349	113	0	361
LVA	103	128	264	112	431	229	187	149	239	356	282	529	217	318	80	85	251	57	99	140	60	283	0

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HOL
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common bulls below diagonal
common three quarter sib group above diagonal

	AUS	BEL	CAN	CHE	DEU	DFS	ESP	FRA	GBR	ITA	NLD	USA	HUN	POL	NZL	ZAF	JPN	CZE	EST	IRL	KOR	SVN	PRT	LVA
AUS	0	477	863	441	775	754	622	797	870	680	882	1051	463	556	486	306	553	530	89	415	310	123	482	208
BEL	415	0	632	505	809	649	583	742	711	676	982	732	409	558	271	245	413	519	90	394	257	153	498	212
CAN	783	603	0	794	1762	1135	1280	1296	1529	1729	1301	3064	898	1107	359	375	1142	1054	150	438	657	188	857	430
CHE	393	506	691	0	855	565	547	573	680	708	797	871	369	523	236	217	372	478	76	347	258	122	427	207
DEU	425	686	720	629	0	1904	1317	1958	1617	2151	2224	2486	961	1546	405	356	1106	1493	206	534	504	288	883	591
DFS	494	568	822	508	923	0	946	1412	1320	1306	1610	1637	728	1116	451	383	792	1055	158	535	431	211	768	384
ESP	476	567	802	450	627	670	0	1101	1066	1280	1075	1504	710	903	318	369	838	862	130	414	474	180	736	354
FRA	483	685	740	488	703	619	729	0	1395	1447	1754	2235	799	1335	477	356	1073	1127	141	525	473	173	747	359
GBR	726	715	1542	676	849	907	866	781	0	1521	1612	2039	788	1103	467	394	875	1015	150	722	489	203	827	396
ITA	550	670	1456	652	1136	998	954	736	1287	0	1557	2392	920	1331	339	350	995	1213	181	486	578	249	892	507
NLD	724	1085	1141	778	1292	1168	913	902	1340	1297	0	2146	801	1296	587	382	890	1342	189	658	453	237	872	420
USA	869	636	3060	797	947	1005	981	1016	1857	1861	1695	0	1164	1552	529	466	1671	1517	198	566	816	217	1094	605
HUN	329	334	793	309	576	519	550	470	637	776	604	1053	0	737	271	299	598	832	113	333	416	140	569	301
POL	357	441	819	376	833	718	572	710	827	994	976	1276	564	0	306	290	738	1072	178	398	481	223	760	451
NZL	388	212	306	198	251	287	258	233	364	270	520	444	203	188	0	205	309	324	44	331	174	63	282	112
ZAF	280	210	348	191	255	302	341	251	366	310	344	494	257	215	186	0	307	301	52	237	228	75	315	122
JPN	279	225	389	213	264	299	302	259	340	356	322	448	241	238	143	193	0	727	107	328	482	135	539	283
CZE	335	384	712	348	890	607	588	640	716	893	1129	1122	704	727	209	224	218	0	140	397	464	203	696	390
EST	43	54	67	35	99	80	57	51	69	91	114	121	66	95	19	21	25	77	0	66	74	53	104	101
IRL	373	379	413	346	383	428	397	413	774	456	601	524	279	292	270	225	187	299	34	0	197	100	366	158
KOR	219	179	599	185	252	289	334	239	368	487	306	920	324	346	120	177	223	323	29	138	0	99	413	234
SVN	85	121	141	90	259	169	133	116	158	213	205	167	103	176	46	53	66	153	31	78	62	0	145	105
PRT	364	499	861	383	609	652	704	592	758	858	863	1112	547	703	217	300	256	571	65	317	349	113	0	344
LVA	93	117	250	102	409	215	176	142	221	344	261	508	204	306	56	72	81	243	52	89	138	57	271	0

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common bulls below diagonal
common three quarter sib group above diagonal

	AUS	BEL	CAN	CHE	DEU	DFS	ESP	FRA	GBR	ITA	NLD	USA	HUN	POL	ZAF	JPN	CZE	EST	IRL	KOR	SVN	PRT	LVA	NZL
AUS	0	484	863	441	775	755	619	797	870	680	882	1051	451	556	306	545	530	90	414	311	123	482	230	36
BEL	416	0	636	506	813	654	584	753	717	678	1013	747	405	561	247	419	521	90	396	258	153	498	231	27
CAN	783	603	0	794	1762	1136	1280	1296	1529	1729	1301	3064	884	1107	375	1135	1054	150	438	658	188	857	456	40
CHE	393	507	691	0	855	566	546	573	680	708	797	871	365	523	217	372	478	76	347	259	122	427	226	29
DEU	425	686	720	629	0	1905	1310	1958	1617	2151	2224	2486	952	1546	356	1104	1493	207	534	505	288	883	619	38
DFS	495	570	822	509	924	0	943	1412	1321	1307	1611	1638	714	1117	383	786	1055	159	535	432	211	768	410	32
ESP	474	564	802	448	621	667	0	1097	1063	1279	1072	1501	701	901	367	828	861	131	413	475	179	735	374	35
FRA	483	686	740	488	703	619	723	0	1395	1447	1754	2235	782	1335	356	1060	1127	142	525	474	173	747	381	31
GBR	726	715	1542	676	849	907	863	781	0	1521	1612	2039	774	1015	394	870	1015	150	719	490	203	827	424	36
ITA	550	670	1456	652	1136	998	951	736	1287	0	1557	2392	917	1331	350	994	1213	181	486	579	249	892	523	35
NLD	724	1108	1141	778	1292	1169	910	902	1340	1297	0	2146	784	1296	382	884	1342	190	658	454	237	872	453	45
USA	869	637	3060	797	947	1006	979	1016	1857	1861	1695	0	1135	1552	466	1651	1517	198	566	817	217	1094	636	40
HUN	317	325	779	305	569	510	535	462	621	772	591	1027	0	732	291	589	820	113	327	415	140	567	318	28
POL	357	441	819	376	833	718	570	710	827	994	976	1276	560	0	290	736	1072	179	398	481	223	760	472	31
ZAF	280	210	348	191	255	302	339	251	366	310	344	494	246	215	0	304	301	52	237	229	75	315	135	15
JPN	279	225	389	213	264	299	302	259	340	356	322	448	235	238	193	0	726	106	326	483	135	539	301	29
CZE	335	384	712	348	890	607	586	640	716	893	1129	1122	693	727	224	218	0	140	397	464	203	696	405	33
EST	43	54	67	35	99	80	57	51	69	91	114	121	66	95	21	25	77	0	66	74	53	104	107	11
IRL	373	379	413	346	383	428	396	413	771	456	601	524	271	292	225	187	299	34	0	198	100	366	172	25
KOR	219	179	599	185	252	289	334	239	368	487	306	923	322	346	177	223	323	29	138	0	99	413	244	26
SVN	85	121	141	90	259	169	131	116	158	213	205	167	103	176	53	66	153	31	78	62	0	145	109	14
PRT	364	499	861	383	609	652	703	592	758	858	863	1112	544	703	300	256	571	65	317	349	113	0	361	22
LVA	103	128	264	112	431	229	188	149	239	356	282	529	217	318	80	85	251	57	99	140	60	283	0	19
NZL	39	27	42	26	35	31	32	31	35	33	43	43	18	21	14	27	25	2	21	24	8	21	9	0

	AUS	BEL	CAN	CHE	DEU	DFS	ESP	FRA	GBR	ITA	NLD	USA	POL	NZL	JPN	CZE	EST	IRL	KOR	SVN	PRT	ZAF	HUN	LVA
AUS	0	470	862	424	772	629	624	734	728	679	728	771	453	479	356	413	89	348	192	123	399	165	308	230
BEL	414	0	624	479	797	593	584	727	630	672	867	628	473	266	310	435	90	334	176	153	426	144	297	231
CAN	782	598	0	757	1756	978	1281	1295	1350	1727	1150	2652	1003	354	839	924	149	373	478	188	740	226	728	456
CHE	389	482	661	0	771	521	541	558	634	687	677	782	448	231	307	397	75	304	185	119	362	132	286	221
DEU	424	684	719	578	0	1763	1320	1934	1461	2149	2084	2177	1418	398	880	1294	216	464	377	288	776	214	748	619
DFS	458	530	791	466	890	0	842	1182	1075	1261	1390	1241	958	362	550	840	152	421	285	207	644	211	523	397
ESP	477	571	804	448	632	622	0	1107	956	1283	978	1333	805	319	656	756	130	345	344	181	641	218	550	377
FRA	483	682	740	479	688	580	739	0	1111	1445	1356	1539	1172	468	735	945	140	411	327	173	623	190	595	381
GBR	640	649	1386	620	797	803	757	673	0	1464	1313	1665	957	359	618	833	138	528	339	201	684	220	574	407
ITA	550	670	1456	638	1136	968	959	736	1251	0	1507	2267	1256	336	871	1126	180	448	442	249	806	241	782	523
NLD	633	941	1026	667	1235	1070	836	785	1108	1270	0	1536	1136	463	634	1154	183	521	307	234	721	211	587	436
USA	699	597	2790	718	895	905	875	750	1636	1831	1249	0	1356	356	1110	1258	188	440	574	214	889	257	865	614
POL	302	377	761	312	745	639	481	624	733	934	868	1155	0	228	611	936	166	314	380	213	658	187	594	446
NZL	385	210	304	195	250	256	260	233	296	270	422	316	144	0	194	234	43	266	105	62	214	101	151	129
JPN	238	195	347	192	240	266	258	227	290	329	278	388	214	118	0	557	94	223	325	123	403	163	424	261
CZE	283	328	636	283	785	523	491	511	597	829	1011	954	651	159	195	0	132	303	336	196	586	201	632	383
EST	43	54	67	35	99	77	57	51		91	110	118	86	19	25	72	0	59	65	53	96	44	101	107
IRL	327	340	372	309	356	367	345	347	544	431	505	449	240	227	162	242	34	0	116	98	294	125	223	164
KOR	146	136	445	142	193	211	231	185	249	373	213	659	289	79	166	237	26	86	0	87	288	125	291	195
SVN	85	121	141	89	259	167	134	116	156	213	204	167	166	46	62	149	31	78	57	0	139	66	131	109
PRT	305	422	718	318	531	540	584	494	614	774	706	905	617	165	212	482	60	258	252	107	0	205	421	338
ZAF	157	130	210	110	151	186	191	152	195	210	183	261	158	92	120	153	19	118	87	46	195	0	170	102
HUN	236	240	656	236	443	391	397	361	459	648	443	801	470	112	187	535	59	194	223	96	414	151	0	283
LVA	103	128	264	110	431	228	192	149	235	356	276	518	303	66	81	241	57	99	114	60	265	62	190	0

	AUS	BEL	CAN	CHE	DEU	DFS	ESP	FRA	GBR	ITA	NLD	USA	HUN	POL	NZL	JPN	CZE	EST	IRL	KOR	SVN	PRT
AUS	0	484	863	441	775	755	619	674	870	680	882	1048	463	555	486	553	530	89	415	311	99	482

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   BEL  416    0  634  504  812  652  586  697  715  676 1011  742  412  560  275  419  521   90  395  258  124  497
   CAN  783  603    0  794 1762 1136 1271 1137 1529 1729 1301 3048  898 1106  359 1142 1054  150  438  660  165  857
   CHE  393  507  691    0  855  566  548  551  680  708  797  867  369  522  236  372  478   76  347  259   99  427
   DEU  425  685  720  629    0 1905 1320 1842 1617 2151 2224 2479  961 1542  405 1106 1493  206  534  505  255  883
   DFS  495  570  822  509  924    0  945 1249 1321 1307 1611 1636  728 1114  451  792 1055  158  534  433  179  767
   ESP  478  573  804  451  634  675    0 1028 1068 1284 1082 1500  714  908  323  835  867  130  419  477  152  743
   FRA  466  660  707  483  655  611  731    0 1258 1407 1473 1810  754 1254  398  919 1081  138  480  445  150  707
   GBR  726  715 1542  676  849  907  874  769    0 1521 1612 2033  788 1102  467  875 1015  150  721  490  172  825
   ITA  550  670 1456  652 1136  998  959  732 1287    0 1557 2386  920 1331  339  995 1213  181  486  580  220  892
   NLD  724 1108 1141  778 1292 1169  923  833 1340 1297    0 2140  801 1294  587  890 1342  189  658  454  199  872
   USA  866  635 3035  792  940 1003  981  858 1849 1853 1688    0 1161 1547  528 1667 1511  197  563  819  188 1091
   HUN  329  334  793  309  576  519  552  467  637  776  604 1051    0  736  271  598  832  113  333  416  124  569
   POL  357  441  819  376  833  718  576  678  827  994  976 1272  564    0  306  737 1072  178  398  481  200  760
   NZL  388  212  306  198  251  287  261  227  364  270  520  442  203  188    0  309  324   44  331  176   52  282
   JPN  278  223  387  212  263  298  301  258  339  355  321  447  240  238  142    0  727  107  328  484  112  539
   CZE  335  384  712  348  890  607  593  624  716  893 1129 1116  704  727  209  218    0  140  397  464  175  695
   EST   43   54   67   35   99   80   57   51   69   91  114  121   66   95   19   25   77    0   66   74   50  104
   IRL  373  379  413  346  383  428  403  409  774  456  601  523  279  292  270  186  299   34    0  198   78  366
   KOR  219  179  599  185  252  289  336  236  368  487  306  923  324  346  120  223  323   29  138    0   86  413
   SVN   68   94  124   74  233  141  111   99  132  187  171  146   89  156   39   50  131   27   63   54    0  118
   PRT  364  499  861  383  609  652  710  583  758  858  863 1105  547  703  217  254  571   65  317  349   93    0
  ------------------------------------------------------------------------------
HOL
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common bulls below diagonal
common three quarter sib group above diagonal
        AUS  BEL  CAN  CHE  DEU  DFS  ESP  FRA  GBR  ITA  NLD  USA  HUN  POL  NZL  JPN  CZE  EST  IRL  SVN  PRT
  ------------------------------------------------------------------------------
   AUS    0  484  863  441  775  754  625  797  870  680  882 1051  463  556  486  553  530   89  402   98  482
   BEL  416    0  636  506  813  653  590  753  717  678 1013  747  412  561  275  420  521   90  384  123  498
   CAN  783  603    0  794 1762 1135 1282 1296 1529 1729 1301 3064  898 1107  359 1142 1054  150  424  164  857
   CHE  393  507  691    0  855  565  549  573  680  708  797  871  369  523  236  372  478   76  340  100  427
   DEU  425  686  720  629    0 1904 1323 1958 1617 2151 2224 2486  961 1546  405 1106 1493  206  518  255  883
   DFS  494  569  822  508  923    0  952 1412 1320 1306 1610 1637  728 1116  451  792 1055  158  511  179  768
   ESP  478  573  804  451  634  675    0 1109 1074 1284 1085 1511  714  910  324  841  868  130  406  152  743
   FRA  483  686  740  488  703  619  739    0 1395 1447 1754 2235  799 1335  477 1073 1127  141  496  150  747
   GBR  726  713 1541  676  847  906  871  780    0 1521 1612 2039  788 1103  467  875 1015  150  684  172  827
   ITA  550  670 1456  652 1136  998  959  736 1285    0 1557 2392  920 1331  339  995 1213  181  479  220  892
   NLD  724 1108 1141  778 1292 1168  923  902 1338 1297    0 2146  801 1296  587  890 1342  189  622  199  872
   USA  869  637 3060  797  947 1006  987 1016 1857 1861 1695    0 1164 1552  529 1671 1517  198  540  188 1094
   HUN  329  334  793  309  576  519  552  470  637  776  604 1053    0  737  271  598  832  113  322  124  569
   POL  357  441  819  376  833  718  576  710  827  994  976 1276  564    0  306  738 1072  178  387  200  760
   NZL  388  212  306  198  251  287  262  233  364  270  520  444  203  188    0  309  324   44  317   52  282
   JPN  278  223  387  212  263  298  301  259  339  355  321  447  240  238  142    0  727  107  314  112  539
   CZE  335  384  712  348  890  607  593  640  715  893 1129 1122  704  727  209  218    0  140  382  176  696
   EST   43   54   67   35   99   80   57   51   69   91  114  121   66   95   19   25   77    0   65   50  104
   IRL  371  378  412  344  381  427  400  408  750  454  593  518  277  292  266  186  298   34    0   78  355
   SVN   68   95  124   75  233  142  112  100  132  188  173  146   90  157   39   51  132   27   64    0  119
   PRT  364  500  861  383  609  652  711  592  758  858  864 1112  548  703  217  254  571   65  317   93    0
  ------------------------------------------------------------------------------
HOL
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common bulls below diagonal
common three quarter sib group above diagonal
        AUS  BEL  CAN  CHE  DEU  DFS  ESP  FRA  GBR  ITA  NLD  USA  HUN  POL  JPN  CZE  EST  IRL  SVN  PRT
  ------------------------------------------------------------------------------
   AUS    0  476  863  441  775  755  627  655  870  680  862 1049  451  554  543  530   89  401   99  489
   BEL  415    0  629  501  806  647  588  677  708  673  964  725  401  555  405  518   90  381  124  501
   CAN  783  602    0  794 1762 1136 1284 1120 1529 1728 1270 3056  884 1106 1125 1054  150  424  165  868
   CHE  393  504  691    0  855  566  551  535  680  708  788  869  365  522  369  478   76  340   99  434
   DEU  425  685  720  629    0 1905 1327 1822 1617 2151 2201 2486  952 1541 1100 1493  206  518  255  893
   DFS  495  568  822  509  924    0  956 1227 1321 1307 1583 1624  714 1114  780 1055  158  511  179  777
   ESP  479  580  806  454  639  680    0 1011 1076 1288 1071 1509  706  912  829  870  132  407  153  756
   FRA  437  639  681  458  630  586  704    0 1235 1395 1427 1781  740 1244  898 1070  138  455  150  711
   GBR  726  712 1541  676  847  906  877  726    0 1521 1587 2032  774 1102  862 1015  150  681  172  833
   ITA  550  670 1456  652 1136  998  965  720 1285    0 1545 2389  917 1331  991 1213  181  479  220  898
   NLD  699 1049 1094  756 1272 1146  901  772 1300 1282    0 2036  777 1283  851 1331  188  616  199  871
   USA  865  632 3060  797  947 1006  988  813 1856 1861 1485    0 1135 1550 1617 1515  198  538  188 1105
   HUN  317  325  779  305  569  510  540  449  621  772  575 1027    0  731  587  820  113  317  124  574
```

```
    POL   357  440  819  376  833  718  579  667  827  994  968 1276  560    0  734 1072  178  387  200  768
    JPN   276  222  386  210  262  297  301  250  336  354  316  444  233  237    0  724  106  310  112  545
    CZE   335  383  712  348  890  607  596  605  715  893 1112 1121  693  727  217    0  140  382  175  700
    EST    43   54   67   35   99   80   59   51   69   91  113  121   66   95   25   77    0   65   50  104
    IRL   371  378  412  344  381  427  402  380  747  454  583  518  270  292  186  298   34    0   78  357
    SVN    68   94  124   74  233  141  112   99  132  187  171  146   89  156   50  131   27   63    0  119
    PRT   367  505  868  388  614  660  724  584  765  863  856 1122  552  709  254  576   65  318   94    0
    ------------------------------------------------------------------------------------------------
HOL
--------
common bulls below diagonal
common three quarter sib group above diagonal
        BEL  CAN  CHE  DEU  DFS  ESP  FRA  GBR  ITA  NLD  USA  CZE  IRL  KOR  SVN  PRT  EST  HUN  POL
        ------------------------------------------------------------------------------------------------
    BEL    0  584  413  652  600  527  637  652  551  809  667  421  356  162  106  414   59  295  331
    CAN  582    0  682 1451 1040 1168 1091 1434 1500 1081 2868  904  408  420  143  728  101  727  693
    CHE  416  585    0  663  475  458  469  578  587  603  725  373  279  166   84  340   54  278  303
    DEU  578  657  486    0 1463 1109 1451 1276 1580 1726 1958 1158  408  321  195  670  143  709  905
    DFS  552  819  421  823    0  864 1222 1309  987 1350 1617  847  508  256  149  640  108  528  659
    ESP  527  737  358  530  631    0  957  972 1063  927 1377  742  369  308  131  624   91  545  575
    FRA  621  679  394  549  586  679    0 1233 1046 1232 1780  914  454  290  127  606   93  593  818
    GBR  676 1468  547  720  904  771  727    0 1222 1320 2023  842  676  300  147  691  102  581  668
    ITA  566 1313  539  879  826  789  625 1071    0 1167 1905  946  374  379  178  689  128  722  808
    NLD  879  992  579 1087 1064  772  730 1108 1053    0 1557 1118  536  274  164  695  129  579  753
    USA  612 2946  639  813 1005  851  813 1854 1620 1219    0 1276  537  499  165  908  123  878  930
    CZE  325  624  265  727  513  490  496  589  721  982  943    0  306  286  149  567   90  628  664
    IRL  364  409  270  315  427  360  380  741  370  514  518  236    0  105   64  292   40  225  228
    KOR  128  403  130  176  194  214  172  225  331  198  582  203   80    0   72  249   44  257  274
    SVN   83  111   64  179  122   98   86  119  157  142  131  114   53   49    0  105   36  106  148
    PRT  413  714  297  500  536  570  490  606  671  680  903  464  255  222   81    0   62  418  463
    EST   36   48   23   65   54   38   36   52   62   77   63   50   23   18   15   38    0   75  107
    HUN  238  650  228  433  391  391  359  454  615  438  795  527  192  197   77  410   41    0  456
    POL  252  523  209  456  431  340  412  505  607  533  713  426  182  192  118  423   51  360    0
    ------------------------------------------------------------------------------------------------
HOL
--------
common bulls below diagonal
common three quarter sib group above diagonal
        BEL  CHE  DEU  DFS  FRA  GBR  ITA  NLD  USA  CZE  JPN  IRL  KOR  CAN  PRT  ESP  SVN  EST  HUN  NZL  POL
        ------------------------------------------------------------------------------------------------
    BEL    0  465  639  302  488  652  567  863  664  386  251  328  171  481  300  535  122   71  253  200  402
    CHE  472    0  737  247  437  651  649  742  839  379  259  300  185  661  272  519  100   64  252  187  397
    DEU  563  547    0  770 1243 1280 1718 1778 1967 1093  688  362  360 1300  540 1115  252  169  627  240 1171
    DFS  241  201  321    0  423  625  530  788  686  437  220  276  131  322  263  416   85   61  225  194  418
    FRA  458  367  504  173    0  823 1017  970 1180  719  539  291  279  815  416  777  144  108  497  181  923
    GBR  674  638  723  352  538    0 1310 1470 1988  775  509  614  340 1131  495 1004  173  123  513  329  846
    ITA  577  589  908  363  584 1122    0 1277 2062  971  694  372  434 1445  567 1135  212  152  679  223 1060
    NLD  939  724 1115  503  619 1231 1114    0 1770 1079  501  527  305  939  507  979  201  154  507  409  983
    USA  599  767  815  343  588 1844 1693 1365    0 1182  914  492  575 2239  671 1434  189  152  791  329 1225
    CZE  298  270  699  231  414  548  732  948  890    0  458  256  329  774  430  689  174  111  545  181  818
    JPN  159  162  206  107  189  248  286  238  336  172    0  161  304  652  286  557  103   74  361  131  508
    IRL  337  304  291  206  252  675  363  503  480  197  121    0  105  300  180  354   73   45  176  224  240
    KOR  130  142  193   76  182  249  369  212  661  233  165   79    0  448  261  342   84   59  278  101  368
    CAN  504  594  643  246  549 1213 1297  943 2521  579  301  323  431    0  517  981  163  115  627  202  847
    PRT  298  235  401  194  365  435  548  480  696  353  170  159  226  521    0  457  112   76  328  139  512
    ESP  543  423  522  273  556  823  830  834  929  443  223  357  231  678  403    0  152  107  492  223  698
    SVN   92   74  235   58   97  132  185  172  146  131   49   58   54  124   86  111    0   47  119   51  192
    EST   45   29   78   26   44   59   79   96   85   63   23   26   26   60   53   50   26    0   88   32  145
    HUN  203  201  384  148  314  408  568  383  724  460  162  148  215  601  333  352   87   53    0  118  529
    NZL  170  168  190  127  138  273  202  375  285  133   97  188   80  206  119  191   39   16   93    0  152
    POL  322  284  657  254  533  668  819  770 1081  576  192  195  282  728  497  425  153   79  433  118    0
    ------------------------------------------------------------------------------------------------
JER
--------
common bulls below diagonal
common three quarter sib group above diagonal
        AUS  CAN  DFS  GBR  ITA  NZL  USA  ZAF  NLD  CHE
        ------------------------------------------------------------------------------------------------
    AUS    0  145   87   99   44  149  246  131   17   14
```

```
    CAN   150     0    89   130    48    74   421   140    13    20
    DFS    64    77     0   102    57    89   146   120    21    32
    GBR    98   135    98     0    51    76   161   108    16    32
    ITA    43    46    56    51     0    36    64    57    14    17
    NZL   150    75    68    78    32     0   147   101    16    17
    USA   240   420   113   167    68   154     0   248    32    33
    ZAF   135   140   103   107    57    98   255     0    26    23
    NLD    13     8    15    13    11    13    33    21     0     4
    CHE    12    18    31    30    18    15    33    23     3     0
    ---------------------------------------------------------------------------

JER
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
        AUS   CAN   DFS   GBR   ITA   NZL   USA   ZAF   NLD   CHE
    ---------------------------------------------------------------------------
    AUS     0   145    87    99    44   149   246   124    17    21
    CAN   150     0    89   130    48    74   421   129    13    25
    DFS    64    77     0   102    57    89   146   111    21    42
    GBR    98   135    98     0    51    76   161   103    16    39
    ITA    43    46    56    51     0    36    64    57    14    24
    NZL   150    75    68    78    32     0   147    92    16    23
    USA   240   420   113   167    68   154     0   228    32    40
    ZAF   129   131    97   103    57    90   237     0    26    35
    NLD    13     8    15    13    11    13    33    21     0     8
    CHE    19    24    41    38    25    21    41    35     6     0
    ---------------------------------------------------------------------------

JER
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
        AUS   CAN   DFS   GBR   ITA   NZL   ZAF   NLD   USA   CHE
    ---------------------------------------------------------------------------
    AUS     0   145    87    99    44   149   124    17   246    25
    CAN   150     0    89   130    48    74   129    13   421    29
    DFS    64    77     0   102    57    89   111    21   146    45
    GBR    98   135    98     0    51    76   103    16   161    42
    ITA    43    46    56    51     0    36    57    14    64    27
    NZL   150    75    68    78    32     0    92    16   147    27
    ZAF   129   131    97   103    57    90     0    26   228    39
    NLD    13     8    15    13    11    13    21     0    32    10
    USA   240   420   113   167    68   154   237    33     0    44
    CHE    22    26    44    41    27    25    38     7    45     0
    ---------------------------------------------------------------------------

JER
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
        AUS   CAN   DFS   GBR   ITA   USA   ZAF   NLD   CHE
    ---------------------------------------------------------------------------
    AUS     0   145    84    98    44   246   130     5    25
    CAN   150     0    89   130    48   421   140     5    29
    DFS    61    76     0   100    57   146   119    10    45
    GBR    97   135    96     0    51   161   108    10    42
    ITA    43    46    56    51     0    64    57     5    27
    USA   240   420   112   167    68     0   247    15    44
    ZAF   134   140   102   107    57   254     0    11    39
    NLD     2     3     9     8     4    14     9     0     5
    CHE    22    26    44    41    27    45    38     5     0
    ---------------------------------------------------------------------------

JER
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
        AUS   CAN   DFS   GBR   ITA   NZL   USA   ZAF   NLD   CHE
    ---------------------------------------------------------------------------
    AUS     0   145    87    99    44   149   246   131    17    25
    CAN   150     0    89   130    48    74   421   140    13    29
    DFS    64    77     0   102    57    89   146   120    21    45
```

```
   GBR    98   135    98     0    51    76   161   108    16    42
   ITA    43    46    56    51     0    36    64    57    14    27
   NZL   150    75    68    78    32     0   147   101    16    27
   USA   240   420   113   167    68   154     0   248    32    44
   ZAF   135   140   103   107    57    98   255     0    26    39
   NLD    13     8    15    13    11    13    33    21     0    10
   CHE    22    26    44    41    27    25    45    38     7     0
 -------------------------------------------------------------------------
JER
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
        AUS   CAN   DFS   GBR   ITA   NZL   USA   ZAF   NLD   CHE
 -------------------------------------------------------------------------
   AUS     0   145    82    99    44   149   246   131    17    25
   CAN   150     0    79   130    48    74   421   140    13    29
   DFS    56    64     0    98    52    82   136   113    19    44
   GBR    98   135    91     0    51    76   161   108    16    42
   ITA    43    46    49    51     0    36    64    57    14    27
   NZL   150    75    60    78    32     0   147   101    16    27
   USA   240   420   101   167    68   154     0   248    32    44
   ZAF   135   140    93   107    57    98   255     0    26    39
   NLD    13     8    13    13    11    13    33    21     0    10
   CHE    22    26    43    41    27    25    45    38     7     0
 -------------------------------------------------------------------------
JER
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
        AUS   CAN   DFS   GBR   ITA   NZL   USA   ZAF   NLD   CHE
 -------------------------------------------------------------------------
   AUS     0   145    87    99    44   149   246   131    17    25
   CAN   150     0    89   130    48    74   421   140    13    29
   DFS    64    77     0   102    57    89   146   120    21    45
   GBR    98   135    98     0    51    76   161   108    16    42
   ITA    43    46    56    51     0    36    64    57    14    27
   NZL   150    75    68    78    32     0   147   101    16    27
   USA   240   420   113   167    68   154     0   248    32    44
   ZAF   135   140   103   107    57    98   255     0    26    39
   NLD    13     8    15    13    11    13    33    21     0    10
   CHE    22    26    44    41    27    25    45    38     7     0
 -------------------------------------------------------------------------
JER
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
        AUS   CAN   DFS   ITA   ZAF   NLD   USA   CHE
 -------------------------------------------------------------------------
   AUS     0   145    79    44   102    17   246    25
   CAN   150     0    79    48   115    13   421    29
   DFS    54    64     0    52    83    19   136    44
   ITA    43    46    49     0    51    14    64    27
   ZAF   104   111    69    49     0    23   193    39
   NLD    13     8    13    11    16     0    32    10
   USA   240   420   101    68   191    33     0    44
   CHE    22    26    43    27    38     7    45     0
 -------------------------------------------------------------------------
JER
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
        AUS   CAN   DFS   GBR   ITA   USA   ZAF   NLD   CHE
 -------------------------------------------------------------------------
   AUS     0   145    84    98    44   246   130    17    25
   CAN   150     0    89   130    48   421   140    13    29
   DFS    62    77     0   100    57   146   119    21    45
   GBR    97   135    96     0    51   161   108    16    42
   ITA    43    46    56    51     0    64    57    14    27
   USA   240   420   113   167    68     0   247    32    44
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  ZAF  134  140  102  107   57  254    0   26   39
  NLD   13    8   15   13   11   33   21    0   10
  CHE   22   26   44   41   27   45   38    7    0
  ------------------------------------------------------------------------------
JER
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
       AUS  CAN  DFS  GBR  ITA  NZL  USA  ZAF  NLD  CHE
  ------------------------------------------------------------------------------
  AUS    0  145   87   99   44  149  246  131   17   25
  CAN  150    0   89  130   48   74  421  140   13   29
  DFS   64   77    0  102   57   89  146  120   21   45
  GBR   98  135   98    0   51   76  161  108   16   42
  ITA   43   46   56   51    0   36   64   57   14   27
  NZL  150   75   68   78   32    0  147  101   16   27
  USA  240  420  113  167   68  154    0  248   32   44
  ZAF  135  140  103  107   57   98  255    0   26   39
  NLD   13    8   15   13   11   13   33   21    0   10
  CHE   22   26   44   41   27   25   45   38    7    0
  ------------------------------------------------------------------------------
JER
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
       AUS  CAN  DFS  GBR  ITA  NZL  USA  ZAF  NLD  CHE
  ------------------------------------------------------------------------------
  AUS    0  145   79   99   44  149  246  131   17   25
  CAN  150    0   73  130   48   74  421  140   13   29
  DFS   54   62    0   89   52   75  129  108   19   44
  GBR   98  135   87    0   51   76  161  108   16   42
  ITA   43   46   49   51    0   36   64   57   14   27
  NZL  150   75   55   78   32    0  147  101   16   27
  USA  240  420   96  167   68  154    0  248   32   44
  ZAF  135  140   91  107   57   98  255    0   26   39
  NLD   13    8   13   13   11   13   33   21    0   10
  CHE   22   26   43   41   27   25   45   38    7    0
  ------------------------------------------------------------------------------
JER
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
       AUS  CAN  DFS  GBR  ITA  NZL  USA  ZAF  NLD  CHE
  ------------------------------------------------------------------------------
  AUS    0  145   87   99   44  149  246  131   17   25
  CAN  150    0   89  130   48   74  421  140   13   29
  DFS   64   77    0  102   57   89  146  120   21   45
  GBR   98  135   98    0   51   76  161  108   16   42
  ITA   43   46   56   51    0   36   64   57   14   27
  NZL  150   75   68   78   32    0  147  101   16   27
  USA  240  420  113  167   68  154    0  248   32   44
  ZAF  135  140  103  107   57   98  255    0   26   39
  NLD   13    8   15   13   11   13   33   21    0   10
  CHE   22   26   44   41   27   25   45   38    7    0
  ------------------------------------------------------------------------------
JER
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
       AUS  CAN  DFS  GBR  ITA  USA  ZAF  NLD  CHE
  ------------------------------------------------------------------------------
  AUS    0  145   85   98   44  246  131   17   25
  CAN  150    0   89  130   48  418  140   13   29
  DFS   63   77    0  100   57  146  120   21   45
  GBR   97  134   96    0   51  161  108   16   42
  ITA   43   46   56   51    0   64   57   14   27
  USA  240  418  113  167   68    0  247   32   44
  ZAF  135  140  103  107   57  254    0   26   39
  NLD   13    8   15   13   11   33   21    0   10
```

```
   CHE    22   26   44   41   27   45   38    7    0
 ------------------------------------------------------------------------------

JER
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
        AUS  CAN  DFS  GBR  ITA  NZL  USA  ZAF  NLD  CHE
 ------------------------------------------------------------------------------
   AUS    0  145   87   99   44  149  246  131   17   25
   CAN  150    0   89  130   48   74  421  140   13   29
   DFS   64   77    0  102   57   89  146  120   21   45
   GBR   98  135   98    0   51   76  161  108   16   42
   ITA   43   46   56   51    0   36   64   57   14   27
   NZL  150   75   68   78   32    0  147  101   16   27
   USA  240  420  113  167   68  154    0  248   32   44
   ZAF  135  140  103  107   57   98  255    0   26   39
   NLD   13    8   15   13   11   13   33   21    0   10
   CHE   22   26   44   41   27   25   45   38    7    0
 ------------------------------------------------------------------------------

JER
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
        AUS  CAN  DFS  GBR  ITA  USA  ZAF  NLD  CHE  NZL
 ------------------------------------------------------------------------------
   AUS    0  145   84   98   44  246  123   17   25   14
   CAN  150    0   89  130   48  421  129   13   29    9
   DFS   62   77    0  100   57  146  110   21   45   11
   GBR   97  135   96    0   51  161  103   16   42   10
   ITA   43   46   56   51    0   64   57   14   27    2
   USA  240  420  113  167   68    0  228   32   44   12
   ZAF  128  131   96  103   57  237    0   26   39   10
   NLD   13    8   15   13   11   33   21    0   10    1
   CHE   22   26   44   41   27   45   38    7    0    3
   NZL   14    9   10    9    1   12   10    0    3    0
 ------------------------------------------------------------------------------

JER
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
        AUS  CAN  DFS  NZL  ZAF  NLD  USA  CHE
 ------------------------------------------------------------------------------
   AUS    0  145   71  149  121   17  246   25
   CAN  150    0   68   74  126   13  421   29
   DFS   49   59    0   68   95   19  122   44
   NZL  150   75   50    0   88   16  147   27
   ZAF  124  125   79   82    0   26  223   39
   NLD   13    8   13   13   21    0   32   10
   USA  240  420   91  154  224   33    0   44
   CHE   22   26   43   25   38    7   45    0
 ------------------------------------------------------------------------------

JER
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
        AUS  CAN  DFS  GBR  ITA  NZL  USA  NLD  CHE
 ------------------------------------------------------------------------------
   AUS    0  145   87   35   44  149  246   17   21
   CAN  150    0   89   37   48   74  421   13   25
   DFS   64   77    0   32   57   89  146   21   42
   GBR   40   43   30    0   14   36   37    4    3
   ITA   43   46   56   15    0   36   64   14   24
   NZL  150   75   68   40   32    0  147   16   23
   USA  240  420  113   40   68  154    0   32   40
   NLD   13    8   15    5   11   13   33    0    8
   CHE   19   24   41    4   25   21   41    6    0
 ------------------------------------------------------------------------------

JER
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   common bulls below diagonal
   common three quarter sib group above diagonal
        AUS  CAN  DFS  GBR  NZL  USA  NLD  CHE
   ------------------------------------------------------------------------------
    AUS    0  145   84   99  149  246   17   21
    CAN  150    0   83  130   74  418   13   25
    DFS   62   75    0   92   81  139   21   42
    GBR   98  134   93    0   73  161   16   39
    NZL  150   75   62   75    0  147   16   23
    USA  240  418  108  167  154    0   32   40
    NLD   13    8   15   13   13   33    0    8
    CHE   19   24   41   38   21   41    6    0
   ------------------------------------------------------------------------------

JER
--------
   common bulls below diagonal
   common three quarter sib group above diagonal
        AUS  CAN  DFS  GBR  ITA  USA  NLD  CHE
   ------------------------------------------------------------------------------
    AUS    0  124   74   83   40  212   15   19
    CAN  129    0   89  130   48  421   13   25
    DFS   53   77    0  100   57  146   21   42
    GBR   81  134   96    0   51  161   16   39
    ITA   38   46   56   51    0   64   14   24
    USA  201  420  113  167   68    0   32   40
    NLD   11    8   15   13   11   33    0    8
    CHE   17   24   41   38   25   41    6    0
   ------------------------------------------------------------------------------

JER
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RDC
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   common bulls below diagonal
   common three quarter sib group above diagonal
        AUS  CAN  DEU  DFS  GBR  NOR  NZL  USA  NLD  CAM  LVA
   ------------------------------------------------------------------------------
    AUS    0   23    9   41    9   12   21   13    8    2   15
    CAN   23    0    7  136   65    4   31  142    3    0   10
    DEU    9    7    0   30    1    8    4    1    8    0   24
    DFS   30  137   20    0   48   82   52   76   30    0  117
    GBR    8   65    1   45    0    0   24   51    1    0    3
    NOR    8    4    7   61    0    0    6    0   20    0   11
    NZL   20   29    4   50   21    5    0   19    2    2    6
    USA   13  136    1   72   48    0   18    0    2    0    4
    NLD    8    3    8   29    1   20    2    2    0    0   11
    CAM    2    0    0    0    0    0    2    0    0    0    0
    LVA   14   10   19   79    3    9    6    4   10    0    0
   ------------------------------------------------------------------------------

RDC
--------
   common bulls below diagonal
   common three quarter sib group above diagonal
        AUS  CAN  DEU  DFS  GBR  NZL  USA  NLD  CAM  NOR  LVA
   ------------------------------------------------------------------------------
    AUS    0   23    9   41    9   21   13    8    2    5   14
    CAN   23    0    7  136   65   31  142    3    0    1   10
    DEU    9    7    0   30    1    4    1    8    0    3   23
    DFS   30  137   20    0   48   50   76   28    0   47   98
    GBR    8   65    1   45    0   24   51    1    0    0    3
    NZL   20   29    4   48   21    0   19    2    2    3    5
    USA   13  136    1   72   48   18    0    2    0    0    4
    NLD    8    3    8   27    1    2    2    0    0   10   10
    CAM    2    0    0    0    0    2    0    0    0    0    0
    NOR    4    1    2   33    0    3    0   10    0    0    1
    LVA   13   10   18   64    3    5    4    9    0    0    0
   ------------------------------------------------------------------------------

RDC
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 common bulls below diagonal
 common three quarter sib group above diagonal
        AUS  CAN  DEU  DFS  GBR  NOR  NZL  USA  NLD  CAM  LVA
 -------------------------------------------------------------------
 AUS     0   23    9   41    9    5   21   13    8    2   15
 CAN    23    0    7  136   65    1   31  140    3    0   10
 DEU     9    7    0   30    1    3    4    1    8    0   24
 DFS    30  137   20    0   48   58   50   76   28    0  117
 GBR     8   65    1   45    0    0   24   50    1    0    3
 NOR     4    1    2   41    0    0    3    0   15    0    2
 NZL    20   29    4   48   21    3    0   19    2    2    6
 USA    13  135    1   72   47    0   18    0    2    0    4
 NLD     8    3    8   27    1   15    2    2    0    0   11
 CAM     2    0    0    0    0    0    2    0    0    0    0
 LVA    14   10   19   79    3    1    6    4   10    0    0
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RDC
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
        AUS  CAN  DEU  DFS  GBR  USA  NLD  CAM  NOR  LVA
 -------------------------------------------------------------------
 AUS     0   23    9   41    9   13    8    2    5   15
 CAN    23    0    7  136   65  142    3    0    3   10
 DEU     9    7    0   30    1    1    8    0    3   24
 DFS    30  137   20    0   48   76   27    0   53  117
 GBR     8   65    1   45    0   51    1    0    0    3
 USA    13  136    1   72   48    0    2    0    0    4
 NLD     8    3    8   26    1    2    0    0   10   10
 CAM     2    0    0    0    0    0    0    0    0    0
 NOR     4    2    2   40    0    0   10    0    0    1
 LVA    14   10   19   79    3    4    9    0    0    0
 -------------------------------------------------------------------
RDC
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
        AUS  CAN  DEU  DFS  GBR  NOR  NZL  USA  NLD  CAM  LVA
 -------------------------------------------------------------------
 AUS     0   23    9   41    9   14   21   13    8    2   15
 CAN    23    0    7  136   65    4   31  142    3    0   10
 DEU     9    7    0   30    1    8    4    1    8    0   24
 DFS    30  137   20    0   48   92   49   76   29    0  117
 GBR     8   65    1   45    0    0   24   51    1    0    3
 NOR    10    4    7   69    0    0    7    0   20    0   12
 NZL    20   29    4   45   21    6    0   19    2    2    6
 USA    13  136    1   72   48    0   18    0    2    0    4
 NLD     8    3    8   28    1   20    2    2    0    0   11
 CAM     2    0    0    0    0    0    2    0    0    0    0
 LVA    14   10   19   79    3   10    6    4   10    0    0
 -------------------------------------------------------------------
RDC
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
        AUS  CAN  DEU  DFS  GBR  NZL  USA  NLD  CAM  NOR  LVA
 -------------------------------------------------------------------
 AUS     0   23    9   41    9   21   13    8    2    5   15
 CAN    23    0    7  136   65   31  142    3    0    1   10
 DEU     9    7    0   30    1    4    1    8    0    3   24
 DFS    30  137   20    0   48   50   76   29    0   46  117
 GBR     8   65    1   45    0   24   51    1    0    0    3
 NZL    20   29    4   48   21    0   19    2    2    3    6
 USA    13  136    1   72   48   18    0    2    0    0    4
 NLD     8    3    8   28    1    2    2    0    0   10   11
 CAM     2    0    0    0    0    2    0    0    0    0    0
 NOR     4    1    2   32    0    3    0   10    0    0    1
 LVA    14   10   19   79    3    6    4   10    0    0    0
```

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RDC
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 common bulls below diagonal
 common three quarter sib group above diagonal
       AUS  CAN  DEU  DFS  GBR  NOR  NZL  USA  NLD  CAM  LVA
--------------------------------------------------------------------------------
  AUS    0   23    9   41    9   14   21   13    8    2   15
  CAN   23    0    7  136   65    4   31  142    3    0   10
  DEU    9    7    0   30    1    8    4    1    8    0   24
  DFS   30  137   20    0   48   95   52   76   30    0  117
  GBR    8   65    1   45    0    0   24   51    1    0    3
  NOR   10    4    7   71    0    0    7    0   20    0   12
  NZL   20   29    4   50   21    6    0   19    2    2    6
  USA   13  136    1   72   48    0   18    0    2    0    4
  NLD    8    3    8   29    1   20    2    2    0    0   11
  CAM    2    0    0    0    0    0    2    0    0    0    0
  LVA   14   10   19   79    3   10    6    4   10    0    0
--------------------------------------------------------------------------------
RDC
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
       AUS  CAN  DEU  DFS  NOR  NLD  USA  CAM  LVA
--------------------------------------------------------------------------------
  AUS    0   23    9   41   14    8   13    2   14
  CAN   23    0    7  135    4    3  142    0   10
  DEU    9    7    0   30    8    8    1    0   23
  DFS   30  136   20    0   92   27   76    0   98
  NOR   10    4    7   69    0   20    0    0   10
  NLD    8    3    8   26   20    0    2    0   10
  USA   13  136    1   72    0    2    0    0    4
  CAM    2    0    0    0    0    0    0    0    0
  LVA   13   10   18   64    8    9    4    0    0
--------------------------------------------------------------------------------
RDC
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
       AUS  CAN  DEU  DFS  GBR  NOR  USA  NLD  CAM  LVA
--------------------------------------------------------------------------------
  AUS    0   23    6   41    9   14   13    8    2   15
  CAN   23    0    5  136   65    4  142    3    0   10
  DEU    6    5    0   22    1    7    1    8    0   12
  DFS   30  137   15    0   48   92   76   28    0  117
  GBR    8   65    1   45    0    0   51    1    0    3
  NOR   10    4    6   69    0    0    0   20    0   12
  USA   13  136    1   72   48    0    0    2    0    4
  NLD    8    3    8   27    1   20    2    0    0   11
  CAM    2    0    0    0    0    0    0    0    0    0
  LVA   14   10   10   79    3   10    4   10    0    0
--------------------------------------------------------------------------------
RDC
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
       AUS  CAN  DEU  DFS  GBR  NOR  NZL  USA  NLD  CAM  LVA
--------------------------------------------------------------------------------
  AUS    0   23    9   41    9   14   21   13    8    2   15
  CAN   23    0    7  136   65    4   31  142    3    0   10
  DEU    9    7    0   30    1    8    4    1    8    0   24
  DFS   30  137   20    0   48   95   52   76   28    0  117
  GBR    8   65    1   45    0    0   24   51    1    0    3
  NOR   10    4    7   71    0    0    7    0   20    0   12
  NZL   20   29    4   50   21    6    0   19    2    2    6
  USA   13  136    1   72   48    0   18    0    2    0    4
  NLD    8    3    8   27    1   20    2    2    0    0   11
  CAM    2    0    0    0    0    0    2    0    0    0    0
  LVA   14   10   19   79    3   10    6    4   10    0    0
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RDC
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
        AUS  CAN  DEU  DFS  GBR  NOR  NZL  USA  NLD  CAM  LVA
--------------------------------------------------------------------------------
 AUS    0   23    9   41    9   14   21   13    8    2   15
 CAN   23    0    7  136   65    4   31  142    3    0   10
 DEU    9    7    0   30    1    8    4    1    8    0   24
 DFS   30  137   20    0   48   92   50   76   28    0  111
 GBR    8   65    1   45    0    0   24   51    1    0    3
 NOR   10    4    7   69    0    0    7    0   20    0   12
 NZL   20   29    4   47   21    6    0   19    2    2    6
 USA   13  136    1   72   48    0   18    0    2    0    4
 NLD    8    3    8   27    1   20    2    2    0    0   11
 CAM    2    0    0    0    0    0    2    0    0    0    0
 LVA   14   10   19   75    3   10    6    4   10    0    0
--------------------------------------------------------------------------------
RDC
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
        AUS  CAN  DEU  DFS  GBR  NOR  NZL  USA  NLD  CAM  LVA
--------------------------------------------------------------------------------
 AUS    0   23    9   41    9   14   21   13    8    2   15
 CAN   23    0    7  136   65    4   31  142    3    0   10
 DEU    9    7    0   30    1    9    4    1    8    0   24
 DFS   30  137   20    0   48   87   52   76   30    0  117
 GBR    8   65    1   45    0    0   24   51    1    0    3
 NOR   10    4    8   66    0    0    7    0   20    0   12
 NZL   20   29    4   50   21    6    0   19    2    2    6
 USA   13  136    1   72   48    0   18    0    2    0    4
 NLD    8    3    8   29    1   20    2    2    0    0   11
 CAM    2    0    0    0    0    0    2    0    0    0    0
 LVA   14   10   19   79    3   10    6    4   10    0    0
--------------------------------------------------------------------------------
RDC
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
        AUS  CAN  DEU  DFS  GBR  NOR  USA  NLD  CAM  LVA
--------------------------------------------------------------------------------
 AUS    0   23    9   41    9   14   13    8    2   15
 CAN   23    0    7  136   65    4  139    3    0   10
 DEU    9    7    0   30    1    8    1    8    0   24
 DFS   30  137   20    0   48   95   76   30    0  117
 GBR    8   65    1   45    0    0   51    1    0    3
 NOR   10    4    7   71    0    0    0   20    0   12
 USA   13  135    1   72   48    0    0    2    0    4
 NLD    8    3    8   29    1   20    2    0    0   11
 CAM    2    0    0    0    0    0    0    0    0    0
 LVA   14   10   19   79    3   10    4   10    0    0
--------------------------------------------------------------------------------
RDC
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
        AUS  CAN  DEU  DFS  GBR  NOR  NZL  USA  NLD  CAM  LVA
--------------------------------------------------------------------------------
 AUS    0   23    9   41    9   14   21   13    8    2   14
 CAN   23    0    7  136   65    4   31  142    3    0   10
 DEU    9    7    0   30    1    9    4    1    8    0   23
 DFS   30  137   20    0   48   94   50   76   29    0   98
 GBR    8   65    1   45    0    0   24   51    1    0    3
 NOR   10    4    8   71    0    0    7    0   20    0   11
 NZL   20   29    4   48   21    6    0   19    2    2    5
 USA   13  136    1   72   48    0   18    0    2    0    4
 NLD    8    3    8   28    1   20    2    2    0    0   10
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  CAM    2    0    0    0    0    0    2    0    0    0    0
  LVA   13   10   18   64    3    9    5    4    9    0    0
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RDC
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 common bulls below diagonal
 common three quarter sib group above diagonal
       AUS  CAN  DEU  DFS  GBR  NOR  USA  NLD  CAM  LVA  NZL
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  AUS    0   23    9   41    9   12   13    8    2   15    2
  CAN   23    0    7  136   65    4  140    3    0   10    1
  DEU    9    7    0   30    1    9    1    8    0   24    0
  DFS   30  137   20    0   48   84   76   30    0  117    3
  GBR    8   65    1   45    0    0   50    1    0    3    2
  NOR    8    4    8   61    0    0    0   19    0   12    1
  USA   13  135    1   72   47    0    0    2    0    4    1
  NLD    8    3    8   29    1   19    2    0    0   11    0
  CAM    2    0    0    0    0    0    0    0    0    0    0
  LVA   14   10   19   79    3   10    4   10    0    0    0
  NZL    2    1    0    3    2    1    1    0    0    0    0
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RDC
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 common bulls below diagonal
 common three quarter sib group above diagonal
       AUS  CAN  DEU  DFS  NOR  NZL  NLD  USA  CAM  LVA
 --------------------------------------------------------------------------

  AUS    0   23    9   36   14   21    8   13    2   15
  CAN   23    0    7  130    4   31    3  142    0   10
  DEU    9    7    0   27    9    4    8    1    0   24
  DFS   27  130   20    0   86   45   27   71    0  100
  NOR   10    4    8   66    0    7   20    0    0   12
  NZL   20   29    4   44    6    0    1   19    2    6
  NLD    8    3    8   26   20    1    0    2    0   10
  USA   13  136    1   68    0   18    2    0    0    4
  CAM    2    0    0    0    0    2    0    0    0    0
  LVA   14   10   19   67   10    6    9    4    0    0
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RDC
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
       AUS  CAN  DEU  DFS  GBR  NOR  NZL  USA  NLD  CAM
 --------------------------------------------------------------------------

  AUS    0   23    9   41    8   12   21   13    8    2
  CAN   23    0    7  136   62    4   31  142    3    0
  DEU    9    7    0   30    1    9    4    1    8    0
  DFS   30  137   20    0   48   95   52   76   30    0
  GBR    7   62    1   45    0    0   21   49    1    0
  NOR    8    4    8   71    0    0    7    0   19    0
  NZL   20   29    4   50   18    6    0   19    2    2
  USA   13  136    1   72   46    0   18    0    2    0
  NLD    8    3    8   29    1   19    2    2    0    0
  CAM    2    0    0    0    0    0    2    0    0    0
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RDC
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
       AUS  CAN  DEU  DFS  GBR  NOR  NZL  USA  NLD  CAM
 --------------------------------------------------------------------------

  AUS    0   23    9   41    8   14   21   13    8    2
  CAN   23    0    7  136   62    4   31  139    3    0
  DEU    9    7    0   30    1    8    4    1    8    0
  DFS   30  137   20    0   48   95   52   76   30    0
  GBR    7   62    1   45    0    0   21   49    1    0
  NOR   10    4    7   71    0    0    7    0   20    0
  NZL   20   29    4   50   18    6    0   19    2    2
  USA   13  135    1   72   46    0   18    0    2    0
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  NLD     8     3     8    29     1    20     2     2     0     0
  CAM     2     0     0     0     0     0     2     0     0     0
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RDC
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
        AUS   CAN   DEU   DFS   GBR   NOR   USA   NLD   CAM
 ---------------------------------------------------------------------------
  AUS     0    23     9    41     8    14    13     8     2
  CAN    23     0     7   136    62     4   142     3     0
  DEU     9     7     0    31     1     8     1     8     0
  DFS    30   137    21     0    48    95    76    30     0
  GBR     7    62     1    45     0     0    49     1     0
  NOR    10     4     7    71     0     0     0    20     0
  USA    13   136     1    72    46     0     0     2     0
  NLD     8     3     8    29     1    20     2     0     0
  CAM     2     0     0     0     0     0     0     0     0
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