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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 (22) 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 the United States of America
were computed.
Brown Swiss, Guernsey, Holstein, Jersey  and Red Dairy Cattle breed
data were included in this evaluation.

Changes in national procedures
-------------------------------------------------------------------------------
Changes in the national genetic evaluation of conformation traits are as
follows:

AUS GUE/HOL Changed the scale of expression of the traits
    JER/RDC
BEL (HOL)    Changes in genetic groups, base changed base on cows classified born in 2010
CHE HOL     Sent in by QUALITAS, new parameters,  Use of HOL-CHR data for ang, fan,
            rtp, loc, bcs, tem and msp (formerly only HOL-CHE data)
            Data cut-off have been altered for some traits. Inclusion of Red Hol (CHR) into B&W
(CHE). Base change

DEA (BSW,SIM)Base change shifting 4 months ahead
DEU HOL/RDC  Parameters for calculating relative breeding values were modified.
    JER


EST HOL/RDC Changed definition of a HERD (more precise location of a cow (owner has different farm
buildings))
JPN HOL     Introduce new database
FRA HOL     Calculation of EDCs has been corrected for some traits and records before 1991 have
been delete
ITA (HOL) Base change plus deleting records with birthyear=1999
NLD HOL/JER Base change + New traits submitted for OUS and OFL + base change
    RDC/BSW




INTERBULL CHANGES COMPARED TO THE DECEMBER ROUTINE RUN
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1)    Data submission for pedigree, EBV/PTA, and parameters is
        possible only through uploading of the data to the Interbull
        Data Exchange Area (IDEA);
2)    Interbull Centre has moved to a completely new MACE evaluation
        software called "Dairy System for International Evaluation
        (DAISIE)", partly because of the extended use of IDEA for EBV/PTA,
        and partly because of our continuous efforts to make the system
        more effective than before;
3)    All trait groups (including conformation traits) are now evaluated
        in-house.
4)    The file containing heritability values now contain more decimal
        places for heritability, and one extra field for the definition of
        reference base population;
5)    The file containing genetic correlations has changed name from
        rG_columns_all to cor{RUNID}.csv, and also contains one extra field
        for the number of common bulls;
6)    The file containing sire genetic standard deviations has changed name
        from sire_std_columns_all to std{RUNID}.csv;
7)    Sire-MGS based pedigree files are not distributed anymore;
8)    Parent averages in the "ipa" format are not distributed anymore;
9)    An import AI bull (type of proof = 21) with official publication
        status 'Y' from a given country is included in the distribution
        file if the bull has a first country proof included from a different
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country OR a second country proof is included with minimum required
number of daughters or EDC (20, 10, 150, 20, 20, and 80) and herds
(20, 10, 150, 20, 20, and 80) for different breeds (BSW, GUE, HOL,
JER, RDC and SIM), respectively;
10)   Bulls with some missing pedigree information (sires and/or dam and/or
birthdate) are excluded from evaluations;
11)   Standardization factors are not used anymore;
12)   Post-processing of genetic correlation are now applied to all trait groups.

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
in the 01x-proof file.

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

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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 TEST RUN
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Test evaluation results are meant for review purposes only and should not be
published.
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^LTable 1. National evaluation data considered in the Interbull
evaluation for conformation traits (April Routine Evaluation 2015).
Number of records for stature by breed

Country	BSW	GUE	HOL	JER	RDC	SIM
ARG						
AUS		51	3278	635	236	
BEL			981			
CAN	172	90	9667	546	739	
CHE	2385		2532			
CZE			3388			
DEA	3013					
DEU			19010		232	
DFS			10634	1727	5524	
ESP			2752			
EST			491			
FRA	279		15255			
FRM						
FRR			204			
GBR	15	184	4798	367	258	
HUN			2163			
IRL			1338			
ISR						
ITA	1688		8392	92		
JPN			4658			
KOR			868			
LTU						
LVA						
NLD	100		13020	35	33	
NOR					1791	
NZL			5046	3305	526	
POL			6882			
PRT			1963			
SVK						
SVN	237		312			
URY						
USA	723	631	28690	3233	211	
ZAF			769	471		
HRV						
No.Records	8612	956	147091	10411	9550	
Pub. Proofs	6950	817	122911	9164	10507	0

^LAPPENDIX I. Sire standard deviations in diagonal and genetic correlations below diagonal
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```
-------------------------------------------------------------------------------
BSW     sta
-------------------------------------------------------------------------------
          CAN     CHE     DEA     FRA     GBR     ITA     NLD     SVN     USA
CAN      6.89
CHE      0.93    1.03
DEA      0.95    0.97   11.37
FRA      0.97    0.94    0.96    0.90
GBR      0.95    0.89    0.87    0.94    0.83
ITA      0.96    0.95    0.96    0.94    0.93   13.70
NLD      0.94    0.92    0.94    0.96    0.92    0.92    4.50
SVN      0.87    0.88    0.91    0.89    0.85    0.90    0.89   16.64
USA      0.98    0.94    0.95    0.96    0.94    0.96    0.94    0.86    1.45


-------------------------------------------------------------------------------
BSW     cwi
-------------------------------------------------------------------------------
          CAN     CHE     DEA     FRA     GBR     ITA     NLD     SVN     USA
CAN      8.77
CHE      0.88    0.85
DEA      0.85    0.83   12.02
FRA      0.84    0.80    0.69    0.90
GBR      0.91    0.84    0.82    0.83    1.37
ITA      0.81    0.85    0.76    0.86    0.74   16.12
NLD      0.88    0.75    0.74    0.69    0.90    0.66    4.41
SVN      0.84    0.78    0.90    0.77    0.79    0.81    0.74   22.26
USA      0.94    0.91    0.83    0.85    0.82    0.89    0.82    0.82    0.80


-------------------------------------------------------------------------------
BSW     bde
-------------------------------------------------------------------------------
          CAN     CHE     DEA     FRA     GBR     ITA     NLD     SVN
CAN      6.94
CHE      0.80    0.80
DEA      0.91    0.89   11.54
FRA      0.78    0.85    0.93    0.89
GBR      0.86    0.85    0.81    0.83    1.42
ITA      0.80    0.90    0.92    0.91    0.86   14.79
NLD      0.85    0.78    0.81    0.82    0.89    0.80    4.04
SVN      0.77    0.81    0.82    0.78    0.80    0.85    0.74   26.07


-------------------------------------------------------------------------------
BSW     ang
-------------------------------------------------------------------------------
          CAN     CHE     FRA     GBR     NLD     USA
CAN      8.31
CHE      0.44    0.92
FRA      0.88    0.40    0.91
GBR      0.85    0.76    0.77    0.80
NLD      0.69    0.53    0.68    0.76    3.37
USA      0.81    0.69    0.73    0.87    0.57    1.01


-------------------------------------------------------------------------------
BSW     ran
-------------------------------------------------------------------------------
          CAN     CHE     DEA     FRA     GBR     ITA     NLD     SVN     USA
CAN      6.48
CHE      0.92    0.89
DEA      0.95    0.95   11.99
FRA      0.97    0.95    0.95    0.95
GBR      0.94    0.91    0.87    0.95    2.11
ITA      0.94    0.93    0.96    0.93    0.91   15.81
NLD      0.95    0.89    0.90    0.94    0.95    0.92    4.47
SVN      0.88    0.88    0.92    0.90    0.84    0.92    0.86   21.82
USA      0.97    0.93    0.96    0.97    0.94    0.91    0.93    0.88    1.08
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--------------------------------------------------------------------------------
BSW     rwi
--------------------------------------------------------------------------------
          CAN     CHE     DEA     FRA     GBR     NLD     SVN     USA
CAN      7.11
CHE      0.87    0.81
DEA      0.88    0.87    12.57
FRA      0.80    0.72    0.77    0.97
GBR      0.89    0.80    0.71    0.88    1.21
NLD      0.93    0.84    0.79    0.74    0.85    4.00
SVN      0.84    0.78    0.82    0.78    0.77    0.81    27.71
USA      0.87    0.82    0.86    0.85    0.90    0.76    0.77    0.68


--------------------------------------------------------------------------------
BSW     rls
--------------------------------------------------------------------------------
          CAN     CHE     DEA     FRA     GBR     ITA     NLD     SVN     USA
CAN      6.89
CHE      0.89    1.09
DEA      0.89    0.92    12.11
FRA      0.92    0.90    0.92    0.99
GBR      0.85    0.88    0.84    0.90    1.16
ITA      0.93    0.86    0.92    0.93    0.83    17.18
NLD      0.88    0.79    0.77    0.89    0.86    0.87    5.32
SVN      0.82    0.81    0.86    0.84    0.78    0.83    0.80    22.44
USA      0.92    0.91    0.91    0.92    0.84    0.87    0.85    0.84    0.74


--------------------------------------------------------------------------------
BSW     fan
--------------------------------------------------------------------------------
          CAN     CHE     DEA     FRA     GBR     ITA     NLD     SVN     USA
CAN      8.09
CHE      0.47    1.15
DEA      0.36    0.89    11.40
FRA      0.74    0.71    0.67    1.02
GBR      0.78    0.72    0.68    0.88    1.05
ITA      0.57    0.85    0.89    0.79    0.80    16.55
NLD      0.59    0.62    0.56    0.80    0.84    0.71    5.82
SVN      0.52    0.82    0.93    0.70    0.72    0.84    0.61    26.27
USA      0.71    0.67    0.60    0.85    0.84    0.82    0.83    0.66    0.69


--------------------------------------------------------------------------------
BSW     hde
--------------------------------------------------------------------------------
          CAN     CHE     DEA     FRA     ITA     NLD     SVN
CAN      8.71
CHE      0.89    1.07
DEA      0.84    0.86    12.02
FRA      0.89    0.82    0.85    1.11
ITA      0.82    0.82    0.89    0.87    16.32
NLD      0.83    0.71    0.76    0.88    0.77    5.82
SVN      0.68    0.68    0.86    0.80    0.87    0.73    31.44


--------------------------------------------------------------------------------
BSW     fua
--------------------------------------------------------------------------------
          CAN     CHE     DEA     FRA     GBR     ITA     NLD     SVN     USA
CAN      7.27
CHE      0.34    0.98
DEA      0.75    0.31    11.70
FRA      0.66    0.60    0.82    0.99
GBR      0.85    0.69    0.71    0.80    1.38
ITA      0.40    0.90    0.46    0.69    0.77    12.56
NLD      0.91    0.42    0.78    0.76    0.85    0.50    4.84
SVN      0.54    0.46    0.81    0.70    0.55    0.54    0.68    23.59
USA      0.89    0.31    0.81    0.72    0.86    0.50    0.85    0.55    1.17
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```
--------------------------------------------------------------------------------
BSW     ruh
--------------------------------------------------------------------------------
        CAN     CHE     DEA     FRA     GBR     ITA     NLD     SVN     USA
CAN     7.03
CHE     0.90    0.95
DEA     0.80    0.86    12.52
FRA     0.87    0.84    0.89    0.95
GBR     0.78    0.80    0.74    0.83    1.28
ITA     0.73    0.85    0.92    0.84    0.85    11.94
NLD     0.78    0.79    0.90    0.84    0.87    0.88    4.50
SVN     0.75    0.76    0.84    0.73    0.66    0.81    0.83    19.63
USA     0.88    0.82    0.85    0.86    0.89    0.87    0.88    0.75    1.03


--------------------------------------------------------------------------------
BSW     ruw
--------------------------------------------------------------------------------
        CAN     CHE     DEA     FRA     ITA     NLD     SVN     USA
CAN     7.99
CHE     0.92    0.97
DEA     0.84    0.90    12.34
FRA     0.88    0.87    0.73    0.89
ITA     0.82    0.87    0.95    0.76    12.59
NLD     0.68    0.55    0.54    0.72    0.73    4.50
SVN     0.74    0.71    0.77    0.70    0.79    0.73    18.15
USA     0.90    0.87    0.86    0.82    0.89    0.79    0.75    0.92


--------------------------------------------------------------------------------
BSW     usu
--------------------------------------------------------------------------------
        CAN     CHE     DEA     FRA     GBR     ITA     NLD     SVN     USA
CAN     8.14
CHE     0.89    0.99
DEA     0.90    0.90    11.76
FRA     0.83    0.90    0.85    0.93
GBR     0.85    0.81    0.75    0.87    2.58
ITA     0.93    0.87    0.90    0.88    0.86    14.34
NLD     0.84    0.82    0.79    0.88    0.91    0.85    4.70
SVN     0.77    0.75    0.75    0.63    0.60    0.75    0.64    26.38
USA     0.85    0.86    0.73    0.81    0.92    0.82    0.88    0.63    1.00


--------------------------------------------------------------------------------
BSW     ude
--------------------------------------------------------------------------------
        CAN     CHE     DEA     FRA     GBR     ITA     NLD     SVN     USA
CAN     6.49
CHE     0.94    0.99
DEA     0.91    0.98    12.04
FRA     0.94    0.95    0.92    0.98
GBR     0.95    0.92    0.86    0.94    1.99
ITA     0.93    0.97    0.97    0.95    0.92    15.78
NLD     0.95    0.95    0.94    0.94    0.95    0.94    4.15
SVN     0.87    0.92    0.92    0.88    0.83    0.93    0.90    21.97
USA     0.91    0.93    0.90    0.93    0.93    0.95    0.92    0.86    1.13


--------------------------------------------------------------------------------
BSW     ftp
--------------------------------------------------------------------------------
        CAN     CHE     DEA     FRA     GBR     NLD     SVN     USA
CAN     7.09
CHE     0.97    1.19
DEA     0.96    0.98    11.43
FRA     0.96    0.95    0.94    0.94
GBR     0.94    0.90    0.86    0.88    1.28
NLD     0.96    0.94    0.94    0.94    0.92    4.81
SVN     0.88    0.86    0.86    0.91    0.84    0.84    18.84
USA     0.92    0.90    0.90    0.89    0.92    0.90    0.82    1.09
```

```
--------------------------------------------------------------------------------
BSW     ftl
--------------------------------------------------------------------------------
        CAN     CHE     DEA     FRA     GBR     ITA     NLD     SVN     USA
CAN     5.89
CHE     0.79    1.22
DEA     0.76    0.98    11.53
FRA     0.86    0.95    0.97    0.98
GBR     0.90    0.90    0.86    0.91    1.30
ITA     0.85    0.95    0.96    0.96    0.92    14.98
NLD     0.83    0.94    0.90    0.91    0.95    0.91    4.86
SVN     0.79    0.87    0.85    0.84    0.83    0.89    0.90    19.20
USA     0.83    0.96    0.96    0.96    0.94    0.97    0.95    0.86    1.36


--------------------------------------------------------------------------------
BSW     rtp
--------------------------------------------------------------------------------
        CAN     CHE     DEA     FRA     ITA     NLD     SVN
CAN     7.18
CHE     0.97    1.22
DEA     0.94    0.98    11.37
FRA     0.98    0.97    0.95    0.96
ITA     0.90    0.87    0.85    0.89    14.93
NLD     0.97    0.95    0.93    0.96    0.89    4.61
SVN     0.88    0.89    0.90    0.87    0.79    0.87    18.42


--------------------------------------------------------------------------------
BSW     ocs
--------------------------------------------------------------------------------
        CAN     CHE     DEA     FRA     GBR     ITA     NLD     SVN     USA
CAN     7.69
CHE     0.85    0.73
DEA     0.70    0.88    10.94
FRA     0.86    0.91    0.89    1.00
GBR     0.84    0.84    0.75    0.88    1.67
ITA     0.79    0.82    0.87    0.87    0.85    10.10
NLD     0.78    0.66    0.67    0.79    0.87    0.70    4.03
SVN     0.67    0.67    0.83    0.75    0.67    0.75    0.73    25.10
USA     0.87    0.70    0.68    0.84    0.89    0.84    0.83    0.72    0.55


--------------------------------------------------------------------------------
BSW     ous
--------------------------------------------------------------------------------
        CAN     CHE     DEA     FRA     GBR     ITA     NLD     SVN     USA
CAN     8.04
CHE     0.89    1.07
DEA     0.85    0.93    11.86
FRA     0.90    0.94    0.94    1.07
GBR     0.81    0.80    0.68    0.74    1.35
ITA     0.84    0.92    0.93    0.87    0.82    11.89
NLD     0.88    0.89    0.89    0.90    0.83    0.86    4.72
SVN     0.65    0.73    0.83    0.69    0.58    0.75    0.70    23.42
USA     0.82    0.87    0.87    0.88    0.86    0.91    0.87    0.66    0.87


--------------------------------------------------------------------------------
BSW     ofl
--------------------------------------------------------------------------------
        CAN     CHE     DEA     FRA     GBR     ITA     NLD     SVN     USA
CAN     7.24
CHE     0.84    0.94
DEA     0.69    0.83    11.48
FRA     0.52    0.64    0.69    1.34
GBR     0.73    0.72    0.58    0.76    1.58
ITA     0.63    0.72    0.83    0.81    0.70    15.36
NLD     0.47    0.46    0.39    0.61    0.72    0.50    4.45
SVN     0.74    0.81    0.87    0.67    0.61    0.77    0.57    31.04
USA     0.46    0.48    0.43    0.82    0.71    0.72    0.55    0.63    0.96
```

```
--------------------------------------------------------------------------------
GUE     sta
--------------------------------------------------------------------------------
          AUS     CAN     GBR     USA
AUS      4.42
CAN      0.85    6.09
GBR      0.88    0.97    1.10
USA      0.87    0.98    0.95    2.32


--------------------------------------------------------------------------------
GUE     cwi
--------------------------------------------------------------------------------
          AUS     CAN     GBR     USA
AUS      6.56
CAN      0.78    6.47
GBR      0.80    0.94    1.64
USA      0.59    0.91    0.90    1.25


--------------------------------------------------------------------------------
GUE     bde
--------------------------------------------------------------------------------
          AUS     CAN     GBR     USA
AUS      5.61
CAN      0.78    6.08
GBR      0.77    0.92    1.36
USA      0.78    0.82    0.90    1.42


--------------------------------------------------------------------------------
GUE     ang
--------------------------------------------------------------------------------
          AUS     CAN     GBR     USA
AUS      7.15
CAN      0.31    7.61
GBR      0.74    0.79    1.47
USA      0.67    0.73    0.91    1.65


--------------------------------------------------------------------------------
GUE     ran
--------------------------------------------------------------------------------
          AUS     CAN     GBR     USA
AUS      8.18
CAN      0.93    6.40
GBR      0.96    0.97    1.64
USA      0.90    0.97    0.97    1.60


--------------------------------------------------------------------------------
GUE     rwi
--------------------------------------------------------------------------------
          AUS     CAN     GBR     USA
AUS      5.02
CAN      0.89    6.78
GBR      0.91    0.94    1.41
USA      0.78    0.94    0.90    1.32


--------------------------------------------------------------------------------
GUE     rls
--------------------------------------------------------------------------------
          AUS     CAN     GBR     USA
AUS      7.19
CAN      0.71    7.34
GBR      0.84    0.70    1.77
USA      0.62    0.86    0.66    0.92


--------------------------------------------------------------------------------
GUE     rlr
--------------------------------------------------------------------------------
          AUS     CAN     USA
AUS      6.46
CAN      0.52    7.36
USA      0.71    0.84    1.01
```

```
--------------------------------------------------------------------------------
GUE     fan
--------------------------------------------------------------------------------
          AUS      CAN      GBR      USA
AUS      8.85
CAN      0.42     8.56
GBR      0.83     0.50     1.61
USA      0.63     0.78     0.66     0.76


--------------------------------------------------------------------------------
GUE     fua
--------------------------------------------------------------------------------
          AUS      CAN      GBR      USA
AUS      6.17
CAN      0.84     7.37
GBR      0.84     0.94     1.54
USA      0.67     0.90     0.89     1.57


--------------------------------------------------------------------------------
GUE     ruh
--------------------------------------------------------------------------------
          AUS      CAN      GBR      USA
AUS      5.75
CAN      0.79     7.32
GBR      0.55     0.72     1.77
USA      0.63     0.78     0.88     1.40


--------------------------------------------------------------------------------
GUE     usu
--------------------------------------------------------------------------------
          AUS      CAN      GBR      USA
AUS      8.37
CAN      0.80     7.20
GBR      0.69     0.66     1.54
USA      0.81     0.70     0.76     1.11


--------------------------------------------------------------------------------
GUE     ude
--------------------------------------------------------------------------------
          AUS      CAN      GBR      USA
AUS      4.55
CAN      0.78     6.06
GBR      0.83     0.97     1.58
USA      0.56     0.92     0.89     1.68


--------------------------------------------------------------------------------
GUE     ftp
--------------------------------------------------------------------------------
          AUS      CAN      GBR      USA
AUS      6.70
CAN      0.77     5.80
GBR      0.76     0.96     1.25
USA      0.81     0.91     0.86     1.27


--------------------------------------------------------------------------------
GUE     ftl
--------------------------------------------------------------------------------
          AUS      CAN      GBR      USA
AUS      6.40
CAN      0.43     4.65
GBR      0.91     0.67     1.80
USA      0.87     0.74     0.97     1.47


--------------------------------------------------------------------------------
GUE     rtp
--------------------------------------------------------------------------------
          AUS      CAN
AUS      7.67
CAN      0.63     5.60
```

```
--------------------------------------------------------------------------------
GUE     ocs
--------------------------------------------------------------------------------
          AUS     CAN     GBR     USA
AUS      7.22
CAN      0.46    8.13
GBR      0.42    0.88    1.54
USA      0.60    0.75    0.80    1.08
--------------------------------------------------------------------------------
GUE     ous
--------------------------------------------------------------------------------
          AUS     CAN     GBR     USA
AUS      4.69
CAN      0.55    7.91
GBR      0.54    0.90    1.45
USA      0.59    0.82    0.74    0.76


--------------------------------------------------------------------------------
GUE     ofl
--------------------------------------------------------------------------------
          AUS     CAN     GBR     USA
AUS      8.85
CAN      0.60    7.55
GBR      0.59    0.59    1.42
USA      0.53    0.78    0.47    1.16


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HOL     sta
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          AUS     BEL     CAN     CHE     CZE     DEU     DFS     ESP     EST     FRA     FRR
GBR       HUN     IRL     ITA     JPN     KOR     NLD     NZL     POL     PRT     SVN     USA     ZAF
AUS      4.58
BEL      0.85    1.12
CAN      0.88    0.95    5.73
CHE      0.89    0.89    0.94   10.27
CZE      0.87    0.94    0.96    0.92   14.95
DEU      0.89    0.93    0.97    0.95    0.97   12.74
DFS      0.86    0.95    0.97    0.94    0.95    0.98   10.78
ESP      0.87    0.92    0.97    0.95    0.95    0.98    0.97    0.95
EST      0.80    0.89    0.91    0.86    0.90    0.93    0.93    0.90   12.29
FRA      0.89    0.96    0.98    0.95    0.96    0.96    0.97    0.98    0.92    1.08
FRR      0.80    0.86    0.89    0.88    0.89    0.94    0.91    0.91    0.88    0.89    0.11
GBR      0.92    0.93    0.97    0.94    0.94    0.95    0.94    0.95    0.87    0.97    0.86
1.14
HUN      0.88    0.92    0.97    0.93    0.95    0.95    0.94    0.97    0.88    0.97    0.85
0.94    1.01
IRL      0.90    0.91    0.94    0.92    0.93    0.92    0.90    0.92    0.83    0.94    0.83
0.98    0.93    0.79
ITA      0.86    0.88    0.96    0.91    0.94    0.95    0.93    0.96    0.90    0.95    0.88
0.95    0.94    0.92    1.13
JPN      0.89    0.96    0.98    0.95    0.95    0.96    0.97    0.97    0.91    0.98    0.87
0.96    0.96    0.93    0.95    1.22
KOR      0.82    0.85    0.83    0.77    0.81    0.80    0.78    0.79    0.74    0.83    0.72
0.83    0.83    0.80    0.77    0.84    4.91
NLD      0.86    0.94    0.96    0.95    0.95    0.98    0.98    0.96    0.95    0.97    0.94
0.93    0.93    0.91    0.92    0.96    0.79    4.46
NZL      0.88    0.84    0.83    0.84    0.83    0.83    0.81    0.80    0.81    0.72    0.87
0.90    0.85    0.92    0.83    0.85    0.79    0.79    0.43
POL      0.83    0.87    0.92    0.88    0.93    0.93    0.92    0.94    0.89    0.93    0.89
0.89    0.93    0.87    0.93    0.92    0.73    0.92    0.71    7.44
PRT      0.86    0.89    0.92    0.89    0.93    0.93    0.92    0.91    0.87    0.92    0.83
0.93    0.92    0.91    0.91    0.92    0.82    0.90    0.82    0.88    0.56
SVN      0.86    0.89    0.92    0.88    0.91    0.94    0.95    0.95    0.88    0.93    0.88
0.90    0.92    0.86    0.90    0.92    0.78    0.94    0.75    0.93    0.86   15.41
USA      0.89    0.90    0.98    0.93    0.93    0.95    0.94    0.95    0.89    0.95    0.86
0.96    0.95    0.94    0.95    0.97    0.80    0.93    0.85    0.91    0.91    0.89    1.21
ZAF      0.88    0.91    0.93    0.89    0.92    0.90    0.87    0.89    0.79    0.92    0.79
0.95    0.91    0.94    0.89    0.92    0.82    0.86    0.87    0.85    0.86    0.82    0.92
9.16
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HOL    cwi
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          AUS     BEL     CAN     CHE     CZE     DEU     DFS     ESP     EST     FRA     FRR
GBR    HUN     IRL     ITA     JPN     KOR     NLD     NZL     POL     PRT     SVN     USA     ZAF
AUS      5.19
BEL      0.64    1.68
CAN      0.66    0.86    6.37
CHE      0.60    0.83    0.93   11.14
CZE      0.65    0.88    0.91    0.86   13.87
DEU      0.65    0.84    0.88    0.84    0.90   12.26
DFS      0.68    0.85    0.92    0.86    0.89    0.92   12.45
ESP      0.61    0.87    0.94    0.87    0.91    0.83    0.85    1.05
EST      0.66    0.76    0.79    0.69    0.77    0.69    0.81    0.77   14.63
FRA      0.51    0.90    0.88    0.92    0.82    0.84    0.82    0.87    0.66    1.16
FRR      0.54    0.55    0.60    0.62    0.63    0.58    0.61    0.57    0.52    0.52    0.06
GBR      0.78    0.85    0.91    0.87    0.88    0.90    0.89    0.86    0.76    0.83    0.66
1.27
HUN      0.46    0.83    0.84    0.83    0.84    0.83    0.82    0.83    0.63    0.88    0.53
0.74    1.07
IRL      0.76    0.82    0.86    0.85    0.83    0.89    0.84    0.81    0.69    0.82    0.64
0.97    0.75    1.45
ITA      0.35    0.78    0.81    0.82    0.77    0.71    0.68    0.83    0.56    0.88    0.47
0.72    0.81    0.73    1.23
JPN      0.32    0.81    0.79    0.83    0.76    0.68    0.68    0.80    0.57    0.90    0.40
0.64    0.79    0.63    0.91    1.26
KOR      0.59    0.78    0.63    0.63    0.76    0.63    0.68    0.67    0.57    0.68    0.46
0.65    0.67    0.63    0.59    0.69    2.86
NLD      0.64    0.88    0.89    0.88    0.88    0.94    0.91    0.86    0.77    0.89    0.65
0.91    0.81    0.87    0.73    0.73    0.66    4.69
NZL      0.77    0.68    0.71    0.65    0.68    0.69    0.67    0.72    0.59    0.61    0.55
0.79    0.57    0.84    0.58    0.50    0.64    0.65    0.35
POL      0.56    0.85    0.88    0.84    0.87    0.83    0.82    0.88    0.76    0.84    0.59
0.83    0.84    0.81    0.76    0.71    0.54    0.84    0.63   13.05
PRT      0.56    0.82    0.80    0.78    0.85    0.86    0.80    0.82    0.71    0.84    0.53
0.78    0.82    0.76    0.74    0.77    0.68    0.83    0.57    0.85    0.29
SVN      0.45    0.71    0.82    0.79    0.77    0.75    0.76    0.79    0.62    0.74    0.65
0.77    0.76    0.73    0.71    0.65    0.48    0.81    0.54    0.81    0.74   21.20
USA      0.48    0.82    0.89    0.88    0.84    0.81    0.80    0.87    0.60    0.91    0.60
0.81    0.87    0.80    0.92    0.89    0.67    0.82    0.67    0.82    0.82    0.81    1.28
ZAF      0.67    0.89    0.90    0.89    0.88    0.88    0.86    0.88    0.71    0.88    0.59
0.94    0.81    0.91    0.81    0.74    0.63    0.89    0.74    0.87    0.80    0.81    0.87
10.93
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HOL     bde
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        AUS     BEL     CAN     CHE     CZE     DEU     DFS     ESP     EST     FRA     FRR
GBR     HUN     IRL     ITA     JPN     KOR     NLD     NZL     POL     PRT     SVN     USA     ZAF
AUS     5.35
BEL     0.70    1.40
CAN     0.86    0.80    5.97
CHE     0.70    0.89    0.84    11.10
CZE     0.83    0.82    0.91    0.80    15.21
DEU     0.80    0.88    0.90    0.89    0.94    11.61
DFS     0.85    0.83    0.92    0.84    0.92    0.93    11.57
ESP     0.76    0.90    0.90    0.91    0.87    0.91    0.87    0.99
EST     0.71    0.82    0.85    0.74    0.84    0.84    0.84    0.86    13.93
FRA     0.51    0.91    0.66    0.88    0.65    0.79    0.70    0.85    0.75    1.08
FRR     0.62    0.81    0.74    0.83    0.75    0.86    0.74    0.81    0.70    0.79    0.11
GBR     0.79    0.91    0.87    0.91    0.87    0.90    0.87    0.93    0.84    0.84    0.78
1.21
HUN     0.67    0.90    0.76    0.86    0.85    0.87    0.83    0.90    0.84    0.85    0.72
0.87    1.08
IRL     0.83    0.90    0.88    0.87    0.88    0.92    0.90    0.91    0.84    0.82    0.77
0.97    0.86    1.25
ITA     0.58    0.86    0.74    0.85    0.77    0.86    0.74    0.89    0.79    0.89    0.84
0.89    0.86    0.87    1.19
JPN     0.54    0.92    0.70    0.88    0.72    0.83    0.74    0.87    0.75    0.95    0.78
0.84    0.85    0.83    0.90    1.25
KOR     0.67    0.77    0.69    0.75    0.76    0.76    0.81    0.73    0.64    0.71    0.58
0.73    0.76    0.73    0.65    0.76    3.63
NLD     0.72    0.90    0.85    0.92    0.84    0.92    0.86    0.90    0.82    0.87    0.86
0.91    0.84    0.90    0.87    0.89    0.75    4.70
NZL     0.78    0.60    0.63    0.54    0.67    0.68    0.68    0.63    0.58    0.45    0.48
0.61    0.58    0.72    0.51    0.48    0.55    0.52    0.35
POL     0.77    0.75    0.87    0.78    0.91    0.89    0.89    0.85    0.81    0.65    0.70
0.82    0.82    0.85    0.74    0.66    0.68    0.79    0.70    12.95
PRT     0.74    0.80    0.76    0.75    0.86    0.88    0.85    0.81    0.73    0.68    0.69
0.82    0.83    0.86    0.78    0.78    0.70    0.78    0.67    0.84    0.31
SVN     0.68    0.86    0.78    0.86    0.80    0.87    0.80    0.87    0.72    0.81    0.74
0.83    0.85    0.81    0.79    0.81    0.71    0.87    0.53    0.77    0.72    21.87
USA     0.59    0.89    0.75    0.89    0.76    0.86    0.76    0.90    0.82    0.91    0.76
0.89    0.91    0.86    0.93    0.93    0.69    0.89    0.54    0.76    0.81    0.82    1.17
ZAF     0.80    0.88    0.88    0.84    0.90    0.89    0.87    0.91    0.81    0.77    0.72
0.93    0.86    0.94    0.83    0.78    0.74    0.84    0.71    0.90    0.87    0.79    0.85
11.09
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	AUS	BEL	CAN	CHE	CZE	DEU	DFS	ESP	EST	FRA	FRR	GBR	HUN	IRL	ITA	JPN	KOR	NLD	POL	PRT	SVN	USA	ZAF
AUS	6.32																						
BEL	0.57	1.11																					
CAN	0.66	0.78	6.37																				
CHE	0.54	0.79	0.88	11.66																			
CZE	0.59	0.76	0.81	0.73	14.42																		
DEU	0.59	0.76	0.86	0.79	0.80	12.59																	
DFS	0.64	0.86	0.88	0.81	0.84	0.87	10.78																
ESP	0.68	0.79	0.91	0.80	0.73	0.78	0.86	0.83															
EST	0.39	0.68	0.59	0.57	0.66	0.64	0.68	0.50	15.35														
FRA	0.62	0.81	0.88	0.86	0.77	0.81	0.87	0.86	0.56	0.98													
FRR	0.45	0.62	0.57	0.46	0.52	0.73	0.61	0.54	0.56	0.63	0.08												
GBR	0.79	0.78	0.91	0.80	0.74	0.82	0.88	0.85	0.54	0.81	0.56	1.25											
HUN	0.59	0.72	0.77	0.74	0.81	0.87	0.80	0.74	0.70	0.78	0.62	0.74	0.89										
IRL	0.75	0.81	0.92	0.82	0.76	0.85	0.90	0.87	0.56	0.86	0.58	0.96	0.80	0.78									
ITA	0.72	0.74	0.89	0.76	0.81	0.84	0.85	0.84	0.59	0.81	0.61	0.89	0.79	0.89	1.30								
JPN	0.65	0.80	0.89	0.76	0.74	0.80	0.90	0.87	0.63	0.86	0.62	0.85	0.73	0.85	0.89	1.46							
KOR	0.66	0.80	0.79	0.76	0.61	0.73	0.75	0.76	0.62	0.74	0.59	0.79	0.69	0.79	0.77	0.80	2.45						
NLD	0.67	0.61	0.72	0.66	0.53	0.45	0.63	0.76	0.39	0.66	0.32	0.76	0.41	0.72	0.66	0.73	0.57	4.55					
POL	0.49	0.68	0.71	0.71	0.62	0.66	0.72	0.77	0.50	0.75	0.37	0.69	0.58	0.70	0.74	0.75	0.57	0.69	6.90				
PRT	0.56	0.69	0.76	0.59	0.70	0.74	0.73	0.71	0.49	0.70	0.70	0.78	0.69	0.76	0.80	0.76	0.77	0.48	0.57	0.27			
SVN	0.54	0.67	0.67	0.75	0.50	0.55	0.59	0.70	0.51	0.68	0.40	0.64	0.47	0.64	0.61	0.62	0.58	0.76	0.81	0.47	24.65		
USA	0.70	0.77	0.94	0.81	0.78	0.85	0.89	0.88	0.56	0.85	0.59	0.91	0.80	0.93	0.89	0.86	0.75	0.66	0.70	0.78	0.65	1.38	
ZAF	0.66	0.80	0.77	0.69	0.68	0.82	0.82	0.73	0.63	0.74	0.59	0.86	0.80	0.87	0.81	0.77	0.84	0.48	0.58	0.70	0.46	0.80	9.41

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HOL    ran
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        AUS     BEL     CAN     CHE     CZE     DEU     DFS     ESP     EST     FRA     FRR
GBR     HUN     IRL     ITA     JPN     KOR     NLD     NZL     POL     PRT     SVN     USA     ZAF
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	AUS	BEL	CAN	CHE	CZE	DEU	DFS	ESP	EST	FRA	FRR	GBR	HUN	IRL	ITA	JPN	KOR	NLD	NZL	POL	PRT	SVN	USA	ZAF
AUS	5.57																							
BEL	0.95	1.65																						
CAN	0.93	0.96	6.01																					
CHE	0.94	0.96	0.96	11.50																				
CZE	0.88	0.94	0.96	0.91	13.11																			
DEU	0.93	0.96	0.98	0.95	0.97	11.86																		
DFS	0.93	0.97	0.98	0.94	0.96	0.98	11.67																	
ESP	0.94	0.96	0.97	0.96	0.95	0.98	0.97	1.14																
EST	0.85	0.90	0.92	0.85	0.92	0.93	0.92	0.90	13.72															
FRA	0.96	0.97	0.97	0.96	0.93	0.96	0.97	0.97	0.89	1.08														
FRR	0.89	0.93	0.89	0.87	0.90	0.92	0.92	0.90	0.86	0.93	0.12													
GBR	0.96	0.95	0.96	0.94	0.94	0.97	0.96	0.96	0.89	0.98	0.93	1.28												
HUN	0.94	0.96	0.96	0.95	0.95	0.97	0.97	0.98	0.89	0.97	0.88	0.95	1.02											
IRL	0.97	0.93	0.94	0.93	0.91	0.94	0.94	0.94	0.86	0.96	0.90	0.99	0.93	1.72										
ITA	0.90	0.94	0.96	0.92	0.95	0.95	0.95	0.96	0.91	0.96	0.89	0.94	0.95	0.93	1.58									
JPN	0.89	0.94	0.98	0.95	0.94	0.96	0.97	0.97	0.91	0.95	0.86	0.92	0.96	0.89	0.95	1.50								
KOR	0.84	0.88	0.89	0.87	0.85	0.90	0.89	0.90	0.82	0.89	0.82	0.85	0.89	0.82	0.87	0.91	5.60							
NLD	0.93	0.96	0.97	0.93	0.95	0.98	0.97	0.97	0.95	0.96	0.93	0.97	0.96	0.95	0.95	0.95	0.86	5.06						
NZL	0.97	0.89	0.88	0.89	0.84	0.88	0.89	0.89	0.79	0.93	0.85	0.95	0.88	0.96	0.85	0.83	0.79	0.88	0.32					
POL	0.91	0.95	0.95	0.95	0.93	0.96	0.95	0.97	0.90	0.95	0.91	0.93	0.96	0.91	0.96	0.96	0.90	0.95	0.85	12.37				
PRT	0.90	0.91	0.92	0.91	0.93	0.94	0.91	0.94	0.85	0.93	0.91	0.94	0.93	0.92	0.91	0.90	0.85	0.94	0.87	0.91	0.49			
SVN	0.91	0.94	0.94	0.93	0.91	0.94	0.95	0.95	0.85	0.93	0.87	0.90	0.93	0.88	0.93	0.94	0.87	0.91	0.83	0.94	0.91	18.93		
USA	0.93	0.94	0.97	0.94	0.96	0.96	0.96	0.96	0.90	0.96	0.90	0.97	0.95	0.95	0.95	0.94	0.86	0.96	0.90	0.92	0.94	0.92	1.46	
ZAF	0.98	0.96	0.95	0.94	0.92	0.95	0.94	0.96	0.88	0.96	0.89	0.96	0.97	0.96	0.93	0.91	0.86	0.95	0.94	0.93	0.92	0.89	0.94	11.43

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HOL    rwi
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         AUS      BEL      CAN      CHE      CZE      DEU      DFS      ESP      EST      FRA      FRR
GBR      HUN      IRL      ITA      JPN      KOR      NLD      NZL      POL      PRT      SVN      USA      ZAF
AUS     5.15
BEL     0.88     1.41
CAN     0.90     0.95     5.91
CHE     0.88     0.95     0.93    11.00
CZE     0.86     0.91     0.94     0.89    12.94
DEU     0.86     0.92     0.95     0.90     0.94    11.29
DFS     0.83     0.92     0.95     0.89     0.92     0.96    12.40
ESP     0.91     0.93     0.98     0.92     0.95     0.96     0.94     1.05
EST     0.80     0.86     0.86     0.82     0.82     0.87     0.86     0.86    13.24
FRA     0.89     0.96     0.96     0.93     0.91     0.95     0.94     0.95     0.87     1.10
FRR     0.85     0.88     0.90     0.85     0.89     0.91     0.90     0.92     0.82     0.92     0.15
GBR     0.86     0.90     0.94     0.87     0.90     0.90     0.91     0.92     0.78     0.94     0.89
1.18
HUN     0.84     0.93     0.93     0.87     0.92     0.92     0.91     0.92     0.84     0.94     0.83
0.91     1.18
IRL     0.69     0.77     0.82     0.73     0.82     0.82     0.83     0.80     0.64     0.82     0.75
0.91     0.84     1.60
ITA     0.80     0.83     0.88     0.81     0.85     0.83     0.85     0.88     0.76     0.89     0.83
0.92     0.88     0.79     1.27
JPN     0.84     0.94     0.95     0.92     0.91     0.94     0.95     0.94     0.85     0.97     0.87
0.93     0.95     0.82     0.88     1.39
KOR     0.73     0.87     0.79     0.81     0.80     0.84     0.81     0.79     0.70     0.87     0.76
0.78     0.84     0.74     0.68     0.88     3.63
NLD     0.89     0.95     0.95     0.92     0.92     0.95     0.94     0.96     0.90     0.95     0.92
0.89     0.91     0.75     0.83     0.94     0.79     4.64
NZL     0.88     0.82     0.85     0.78     0.83     0.82     0.79     0.84     0.68     0.82     0.79
0.85     0.80     0.81     0.75     0.81     0.77     0.82     0.29
POL     0.85     0.92     0.91     0.90     0.92     0.89     0.90     0.91     0.87     0.91     0.87
0.89     0.90     0.74     0.85     0.90     0.75     0.89     0.69    11.35
PRT     0.76     0.85     0.87     0.80     0.86     0.87     0.88     0.86     0.75     0.85     0.81
0.86     0.88     0.82     0.82     0.84     0.80     0.82     0.73     0.84     0.38
SVN     0.82     0.89     0.91     0.87     0.90     0.89     0.87     0.91     0.82     0.87     0.83
0.87     0.85     0.78     0.75     0.86     0.74     0.89     0.73     0.92     0.81    23.62
USA     0.78     0.85     0.91     0.81     0.85     0.83     0.87     0.88     0.74     0.89     0.83
0.95     0.89     0.91     0.90     0.89     0.74     0.82     0.80     0.83     0.85     0.83     1.29
ZAF     0.79     0.85     0.87     0.79     0.82     0.86     0.85     0.84     0.73     0.87     0.80
0.93     0.91     0.87     0.84     0.89     0.77     0.82     0.80     0.83     0.81     0.79     0.90
11.55
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HOL     rls
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          AUS      BEL      CAN      CHE      CZE      DEU      DFS      ESP      EST      FRA      FRR
GBR       HUN      IRL      ITA      JPN      KOR      NLD      NZL      POL      PRT      SVN      USA      ZAF
```

	AUS	BEL	CAN	CHE	CZE	DEU	DFS	ESP	EST	FRA	FRR	GBR	HUN	IRL	ITA	JPN	KOR	NLD	NZL	POL	PRT	SVN	USA	ZAF
AUS	6.12																							
BEL	0.80	1.87																						
CAN	0.75	0.94	6.57																					
CHE	0.83	0.92	0.92	11.39																				
CZE	0.75	0.91	0.92	0.81	16.31																			
DEU	0.78	0.92	0.95	0.90	0.94	11.76																		
DFS	0.72	0.93	0.97	0.89	0.91	0.95	13.47																	
ESP	0.76	0.93	0.94	0.89	0.89	0.94	0.94	1.14																
EST	0.68	0.79	0.82	0.71	0.80	0.84	0.83	0.84	15.20															
FRA	0.81	0.90	0.86	0.89	0.84	0.88	0.85	0.88	0.78	1.08														
FRR	0.65	0.81	0.70	0.69	0.71	0.77	0.73	0.73	0.70	0.78	0.13													
GBR	0.87	0.86	0.85	0.89	0.84	0.87	0.82	0.82	0.71	0.91	0.72	1.30												
HUN	0.75	0.91	0.93	0.86	0.92	0.94	0.91	0.94	0.78	0.87	0.69	0.84	1.07											
IRL	0.89	0.82	0.77	0.84	0.80	0.79	0.74	0.73	0.64	0.85	0.67	0.96	0.76	1.60										
ITA	0.69	0.86	0.89	0.81	0.86	0.90	0.87	0.90	0.76	0.87	0.80	0.83	0.91	0.75	1.60									
JPN	0.71	0.90	0.97	0.88	0.91	0.94	0.96	0.93	0.83	0.85	0.69	0.80	0.90	0.71	0.87	1.70								
KOR	0.56	0.84	0.85	0.76	0.84	0.84	0.86	0.86	0.71	0.80	0.64	0.71	0.83	0.61	0.79	0.87	2.52							
NLD	0.76	0.92	0.92	0.88	0.88	0.93	0.92	0.91	0.85	0.88	0.78	0.87	0.87	0.83	0.87	0.89	0.83	5.28						
NZL	0.81	0.60	0.59	0.72	0.62	0.65	0.54	0.60	0.52	0.75	0.49	0.80	0.63	0.80	0.59	0.59	0.56	0.60	0.15					
POL	0.77	0.93	0.93	0.88	0.95	0.95	0.91	0.92	0.81	0.89	0.73	0.83	0.95	0.77	0.89	0.93	0.84	0.86	0.69	14.02				
PRT	0.73	0.82	0.80	0.73	0.81	0.85	0.82	0.84	0.75	0.81	0.77	0.79	0.85	0.68	0.84	0.81	0.77	0.80	0.54	0.79	0.26			
SVN	0.61	0.84	0.87	0.81	0.82	0.92	0.90	0.90	0.77	0.83	0.68	0.74	0.87	0.63	0.84	0.88	0.83	0.87	0.52	0.87	0.80	22.42		
USA	0.73	0.94	0.96	0.87	0.91	0.93	0.95	0.94	0.83	0.86	0.73	0.83	0.93	0.74	0.89	0.94	0.85	0.90	0.57	0.91	0.84	0.88	1.65	
ZAF	0.89	0.86	0.83	0.88	0.81	0.81	0.77	0.83	0.67	0.87	0.64	0.91	0.82	0.91	0.81	0.76	0.66	0.83	0.76	0.82	0.69	0.67	0.82	11.05

	AUS	BEL	CAN	CHE	CZE	DEU	DFS	ESP	EST	FRA	FRR	GBR	HUN	IRL	ITA	JPN	KOR	NLD	POL	PRT	SVN	USA	ZAF
AUS	6.59																						
BEL	0.72	1.89																					
CAN	0.64	0.84	6.42																				
CHE	0.81	0.86	0.77	11.86																			
CZE	0.57	0.82	0.80	0.72	16.20																		
DEU	0.60	0.89	0.89	0.76	0.83	11.27																	
DFS	0.64	0.84	0.91	0.77	0.78	0.92	12.97																
ESP	0.62	0.88	0.88	0.76	0.79	0.87	0.90	1.14															
EST	0.58	0.66	0.65	0.57	0.62	0.75	0.79	0.73	15.09														
FRA	0.74	0.90	0.84	0.86	0.76	0.85	0.83	0.87	0.71	1.07													
FRR	0.54	0.77	0.63	0.63	0.65	0.80	0.70	0.69	0.63	0.76	0.10												
GBR	0.45	0.63	0.68	0.59	0.56	0.64	0.62	0.71	0.43	0.62	0.51	1.30											
HUN	0.64	0.87	0.79	0.82	0.83	0.82	0.82	0.81	0.70	0.87	0.68	0.53	1.15										
IRL	0.43	0.58	0.64	0.52	0.60	0.56	0.55	0.65	0.37	0.58	0.36	0.79	0.48	1.68									
ITA	0.55	0.76	0.80	0.65	0.81	0.78	0.74	0.82	0.59	0.81	0.70	0.75	0.79	0.72	1.83								
JPN	0.68	0.78	0.90	0.80	0.74	0.82	0.91	0.81	0.74	0.83	0.55	0.50	0.78	0.50	0.70	1.78							
KOR	0.55	0.71	0.85	0.69	0.72	0.76	0.85	0.81	0.66	0.79	0.58	0.49	0.74	0.46	0.73	0.89	2.25						
NLD	0.60	0.91	0.86	0.72	0.79	0.90	0.90	0.87	0.76	0.82	0.75	0.62	0.84	0.60	0.75	0.82	0.73	4.63					
POL	0.73	0.85	0.86	0.78	0.85	0.83	0.84	0.79	0.71	0.82	0.76	0.52	0.84	0.52	0.79	0.80	0.79	0.80	14.83				
PRT	0.58	0.81	0.75	0.74	0.79	0.86	0.76	0.77	0.68	0.80	0.77	0.56	0.77	0.43	0.67	0.68	0.70	0.75	0.74	0.23			
SVN	0.48	0.81	0.82	0.70	0.74	0.82	0.82	0.79	0.65	0.79	0.67	0.53	0.82	0.43	0.71	0.80	0.78	0.87	0.72	0.80	24.90		
USA	0.58	0.79	0.88	0.69	0.77	0.78	0.83	0.81	0.62	0.76	0.65	0.71	0.81	0.62	0.87	0.79	0.79	0.81	0.84	0.69	0.80	1.84	
ZAF	0.67	0.75	0.59	0.71	0.63	0.54	0.55	0.52	0.39	0.65	0.51	0.44	0.67	0.42	0.61	0.56	0.56	0.57	0.74	0.51	0.53	0.71	9.52

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HOL     fan
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          AUS      BEL      CAN      CHE      CZE      DEU      DFS      ESP      EST      FRA      FRR
GBR       HUN      IRL      ITA      JPN      KOR      NLD      POL      PRT      SVN      USA      ZAF
AUS       5.82
BEL       0.73     2.02
CAN       0.67     0.84     6.53
CHE       0.72     0.89     0.74    11.13
CZE       0.74     0.83     0.84     0.70    17.51
DEU       0.72     0.85     0.85     0.70     0.91    12.85
DFS       0.63     0.91     0.88     0.76     0.81     0.85    13.25
ESP       0.70     0.77     0.87     0.65     0.85     0.87     0.82     1.05
EST       0.66     0.66     0.68     0.57     0.78     0.72     0.67     0.77    15.81
FRA       0.82     0.77     0.78     0.69     0.86     0.88     0.69     0.83     0.75     1.05
FRR       0.57     0.78     0.61     0.61     0.67     0.75     0.68     0.65     0.57     0.73     0.11
GBR       0.82     0.76     0.83     0.64     0.84     0.89     0.72     0.86     0.68     0.92     0.65
1.36
HUN       0.82     0.78     0.82     0.78     0.92     0.85     0.72     0.85     0.77     0.91     0.55
0.87     1.06
IRL       0.77     0.76     0.83     0.61     0.78     0.85     0.73     0.81     0.59     0.82     0.61
0.95     0.78     1.67
ITA       0.55     0.71     0.78     0.59     0.71     0.77     0.72     0.80     0.58     0.74     0.66
0.76     0.70     0.74     1.62
JPN       0.76     0.75     0.69     0.80     0.84     0.78     0.69     0.72     0.73     0.78     0.55
0.73     0.87     0.60     0.62     1.99
KOR       0.59     0.62     0.73     0.47     0.78     0.76     0.64     0.77     0.59     0.78     0.50
0.77     0.79     0.66     0.70     0.64     1.82
NLD       0.75     0.80     0.78     0.67     0.83     0.89     0.76     0.80     0.79     0.85     0.76
0.88     0.83     0.81     0.73     0.79     0.74     5.28
POL       0.66     0.76     0.82     0.72     0.74     0.71     0.74     0.74     0.62     0.75     0.47
0.76     0.80     0.74     0.73     0.68     0.69     0.65    13.38
PRT       0.57     0.53     0.59     0.42     0.73     0.76     0.61     0.72     0.69     0.76     0.58
0.70     0.67     0.56     0.64     0.66     0.74     0.71     0.42     0.18
SVN       0.34     0.53     0.60     0.37     0.67     0.71     0.71     0.73     0.50     0.58     0.50
0.62     0.55     0.61     0.65     0.47     0.60     0.60     0.52     0.66    22.38
USA       0.69     0.78     0.89     0.66     0.82     0.84     0.79     0.85     0.73     0.81     0.60
0.85     0.82     0.79     0.87     0.74     0.78     0.80     0.80     0.75     0.64     1.64
ZAF       0.88     0.79     0.79     0.77     0.80     0.81     0.73     0.81     0.64     0.87     0.63
0.89     0.88     0.83     0.76     0.79     0.65     0.80     0.69     0.66     0.47     0.84    11.69
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	AUS	BEL	CAN	CHE	CZE	DEU	DFS	ESP	EST	FRA	FRR	GBR	HUN	IRL	ITA	JPN	KOR	NLD	NZL	POL	PRT	SVN	USA	ZAF
AUS	5.53																							
BEL	0.75	1.58																						
CAN	0.77	0.75	5.83																					
CHE	0.78	0.77	0.90	11.60																				
CZE	0.79	0.84	0.91	0.86	15.25																			
DEU	0.75	0.80	0.93	0.85	0.94	12.17																		
DFS	0.81	0.84	0.91	0.89	0.92	0.90	11.91																	
ESP	0.77	0.77	0.89	0.82	0.82	0.84	0.84	0.99																
EST	0.63	0.72	0.78	0.71	0.84	0.84	0.84	0.64	14.73															
FRA	0.79	0.91	0.89	0.86	0.91	0.90	0.91	0.84	0.81	1.07														
FRR	0.61	0.81	0.74	0.66	0.77	0.82	0.77	0.76	0.68	0.83	0.11													
GBR	0.78	0.77	0.95	0.85	0.92	0.95	0.88	0.88	0.78	0.87	0.76	1.18												
HUN	0.80	0.75	0.91	0.87	0.94	0.88	0.89	0.83	0.80	0.85	0.65	0.87	1.06											
IRL	0.80	0.78	0.90	0.82	0.84	0.90	0.82	0.90	0.69	0.86	0.74	0.96	0.78	1.21										
ITA	0.70	0.61	0.90	0.81	0.79	0.86	0.80	0.86	0.70	0.79	0.70	0.91	0.82	0.87	1.36									
JPN	0.72	0.72	0.95	0.90	0.87	0.87	0.92	0.81	0.80	0.84	0.69	0.90	0.87	0.82	0.88	1.68								
KOR	0.75	0.79	0.75	0.77	0.83	0.76	0.81	0.72	0.74	0.78	0.64	0.81	0.75	0.77	0.69	0.79	3.36							
NLD	0.75	0.86	0.92	0.88	0.92	0.94	0.92	0.87	0.84	0.93	0.84	0.92	0.87	0.88	0.83	0.89	0.81	5.15						
NZL	0.78	0.80	0.80	0.75	0.75	0.82	0.80	0.81	0.66	0.84	0.69	0.84	0.70	0.88	0.78	0.77	0.71	0.84	0.39					
POL	0.72	0.80	0.81	0.84	0.90	0.90	0.87	0.80	0.80	0.87	0.75	0.83	0.82	0.82	0.75	0.80	0.78	0.87	0.76	10.85				
PRT	0.64	0.75	0.67	0.66	0.65	0.64	0.67	0.71	0.58	0.66	0.66	0.66	0.54	0.73	0.60	0.67	0.72	0.67	0.74	0.64	0.29			
SVN	0.42	0.73	0.39	0.39	0.50	0.49	0.51	0.53	0.47	0.57	0.62	0.37	0.38	0.45	0.33	0.38	0.51	0.55	0.56	0.56	0.73	18.78		
USA	0.73	0.66	0.95	0.84	0.82	0.89	0.85	0.90	0.71	0.82	0.71	0.94	0.84	0.90	0.94	0.91	0.71	0.88	0.81	0.78	0.63	0.34	1.44	
ZAF	0.81	0.82	0.91	0.83	0.94	0.92	0.89	0.86	0.77	0.86	0.71	0.94	0.88	0.91	0.82	0.85	0.85	0.89	0.79	0.83	0.71	0.47	0.86	11.05

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HOL    ruh
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         AUS     BEL     CAN     CHE     CZE     DEU     DFS     ESP     EST     FRA     FRR
GBR      HUN     IRL     ITA     JPN     KOR     NLD     NZL     POL     PRT     SVN     USA     ZAF
AUS      5.07
BEL      0.83    1.35
CAN      0.77    0.91    5.64
CHE      0.75    0.88    0.91   10.81
CZE      0.82    0.88    0.89    0.81   16.16
DEU      0.82    0.88    0.87    0.86    0.89   13.22
DFS      0.79    0.90    0.89    0.91    0.85    0.94   11.56
ESP      0.83    0.84    0.85    0.85    0.79    0.90    0.91    0.95
EST      0.71    0.78    0.75    0.70    0.76    0.75    0.80    0.80   13.61
FRA      0.78    0.89    0.91    0.88    0.85    0.91    0.92    0.89    0.73    1.10
FRR      0.70    0.82    0.69    0.70    0.70    0.81    0.78    0.77    0.68    0.78    0.10
GBR      0.84    0.81    0.81    0.82    0.77    0.87    0.90    0.89    0.73    0.88    0.71
1.20
HUN      0.84    0.80    0.84    0.85    0.86    0.88    0.85    0.91    0.74    0.86    0.63
0.86    1.00
IRL      0.78    0.77    0.78    0.80    0.72    0.83    0.88    0.89    0.73    0.83    0.66
0.97    0.84    1.07
ITA      0.76    0.74    0.74    0.76    0.73    0.84    0.86    0.92    0.75    0.82    0.76
0.89    0.85    0.90    1.29
JPN      0.80    0.89    0.89    0.90    0.84    0.88    0.92    0.93    0.78    0.90    0.74
0.84    0.86    0.82    0.87    1.44
KOR      0.70    0.86    0.84    0.78    0.78    0.72    0.73    0.77    0.68    0.77    0.64
0.63    0.76    0.60    0.66    0.83    3.97
NLD      0.78    0.85    0.81    0.84    0.78    0.93    0.95    0.92    0.79    0.87    0.78
0.89    0.85    0.86    0.88    0.88    0.70    4.79
NZL      0.84    0.78    0.80    0.81    0.77    0.83    0.83    0.82    0.68    0.82    0.64
0.90    0.85    0.89    0.83    0.80    0.64    0.82    0.38
POL      0.74    0.80    0.70    0.76    0.74    0.84    0.86    0.85    0.76    0.80    0.80
0.82    0.81    0.81    0.83    0.83    0.63    0.86    0.74    7.71
PRT      0.77    0.80    0.71    0.71    0.74    0.80    0.80    0.85    0.63    0.80    0.70
0.84    0.82    0.83    0.84    0.78    0.69    0.82    0.72    0.80    0.33
SVN      0.63    0.82    0.73    0.68    0.70    0.78    0.75    0.75    0.73    0.76    0.70
0.59    0.67    0.57    0.61    0.73    0.70    0.76    0.61    0.69    0.64   18.01
USA      0.78    0.84    0.87    0.86    0.80    0.90    0.90    0.89    0.77    0.88    0.75
0.93    0.84    0.92    0.89    0.86    0.73    0.87    0.88    0.78    0.80    0.66    1.53
ZAF      0.75    0.80    0.78    0.83    0.77    0.80    0.86    0.83    0.68    0.79    0.61
0.88    0.78    0.86    0.82    0.83    0.66    0.81    0.80    0.63    0.75    0.57    0.84
10.36
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HOL    usu
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        AUS     BEL     CAN     CHE     CZE     DEU     DFS     ESP     EST     FRA     FRR
GBR     HUN     IRL     ITA     JPN     KOR     NLD     NZL     POL     PRT     SVN     USA     ZAF
AUS     5.96
BEL     0.69    1.42
CAN     0.82    0.77    5.46
CHE     0.76    0.89    0.90   11.84
CZE     0.62    0.88    0.78    0.87   14.11
DEU     0.75    0.78    0.90    0.90    0.89   11.60
DFS     0.71    0.87    0.82    0.90    0.79    0.80   11.78
ESP     0.79    0.69    0.85    0.79    0.63    0.73    0.79    0.90
EST     0.66    0.83    0.77    0.77    0.83    0.84    0.80    0.63   14.50
FRA     0.76    0.87    0.80    0.86    0.72    0.74    0.91    0.82    0.75    1.08
FRR     0.62    0.69    0.68    0.68    0.56    0.65    0.75    0.75    0.63    0.73    0.11
GBR     0.84    0.68    0.86    0.81    0.63    0.76    0.84    0.91    0.65    0.89    0.74
1.24
HUN     0.74    0.91    0.83    0.93    0.89    0.84    0.92    0.79    0.82    0.91    0.62
0.78    0.99
IRL     0.85    0.72    0.89    0.84    0.70    0.79    0.79    0.91    0.66    0.85    0.69
0.95    0.80    1.09
ITA     0.77    0.72    0.86    0.79    0.73    0.79    0.80    0.90    0.68    0.81    0.71
0.87    0.80    0.90    1.45
JPN     0.61    0.94    0.69    0.83    0.76    0.68    0.83    0.60    0.77    0.88    0.60
0.65    0.87    0.66    0.65    1.69
KOR     0.73    0.76    0.84    0.81    0.75    0.84    0.74    0.73    0.70    0.68    0.56
0.64    0.80    0.71    0.80    0.68    3.02
NLD     0.80    0.81    0.86    0.85    0.70    0.78    0.90    0.88    0.79    0.92    0.85
0.92    0.84    0.88    0.83    0.77    0.69    4.62
NZL     0.68    0.32    0.60    0.45    0.34    0.47    0.38    0.65    0.37    0.45    0.45
0.61    0.42    0.71    0.66    0.30    0.48    0.54    0.37
POL     0.76    0.82    0.84    0.88    0.87    0.90    0.83    0.76    0.82    0.73    0.61
0.72    0.86    0.76    0.81    0.69    0.83    0.76    0.48   10.30
PRT     0.73    0.67    0.76    0.75    0.74    0.83    0.70    0.78    0.72    0.67    0.67
0.73    0.72    0.80    0.83    0.54    0.78    0.72    0.59    0.79    0.33
SVN     0.55    0.70    0.72    0.72    0.83    0.84    0.63    0.59    0.75    0.51    0.54
0.49    0.68    0.59    0.62    0.55    0.68    0.58    0.40    0.81    0.76   21.79
USA     0.80    0.71    0.86    0.79    0.66    0.75    0.86    0.91    0.68    0.89    0.72
0.94    0.82    0.91    0.90    0.69    0.73    0.91    0.63    0.76    0.74    0.53    1.51
ZAF     0.86    0.69    0.76    0.75    0.61    0.65    0.81    0.84    0.60    0.83    0.63
0.88    0.80    0.85    0.82    0.66    0.68    0.85    0.67    0.70    0.68    0.41    0.89
11.12
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--------------------------------------------------------------------------------
HOL    ude
--------------------------------------------------------------------------------
         AUS     BEL     CAN     CHE     CZE     DEU     DFS     ESP     EST     FRA     FRR
GBR      HUN     IRL     ITA     JPN     KOR     NLD     POL     PRT     SVN     USA     ZAF
```

	AUS	BEL	CAN	CHE	CZE	DEU	DFS	ESP	EST	FRA	FRR	GBR	HUN	IRL	ITA	JPN	KOR	NLD	POL	PRT	SVN	USA	ZAF
AUS	4.41																						
BEL	0.94	1.45																					
CAN	0.93	0.96	5.83																				
CHE	0.96	0.96	0.95	11.40																			
CZE	0.93	0.96	0.98	0.95	14.78																		
DEU	0.94	0.96	0.98	0.96	0.98	12.96																	
DFS	0.93	0.95	0.97	0.96	0.95	0.97	11.45																
ESP	0.95	0.96	0.98	0.96	0.96	0.97	0.97	1.14															
EST	0.89	0.92	0.94	0.89	0.94	0.94	0.95	0.94	13.61														
FRA	0.96	0.96	0.97	0.97	0.95	0.97	0.97	0.97	0.91	1.10													
FRR	0.88	0.93	0.90	0.92	0.89	0.94	0.91	0.92	0.87	0.94	0.09												
GBR	0.95	0.96	0.97	0.95	0.95	0.96	0.96	0.96	0.92	0.96	0.90	1.17											
HUN	0.93	0.96	0.97	0.96	0.97	0.96	0.97	0.98	0.94	0.96	0.88	0.95	1.13										
IRL	0.95	0.96	0.95	0.94	0.93	0.94	0.93	0.94	0.89	0.94	0.87	0.99	0.93	1.32									
ITA	0.93	0.93	0.97	0.95	0.96	0.96	0.95	0.98	0.92	0.97	0.92	0.94	0.97	0.92	1.38								
JPN	0.94	0.94	0.97	0.95	0.94	0.94	0.97	0.97	0.92	0.97	0.89	0.95	0.96	0.94	0.96	1.35							
KOR	0.88	0.84	0.88	0.90	0.84	0.86	0.88	0.90	0.81	0.90	0.84	0.87	0.88	0.85	0.91	0.93	5.02						
NLD	0.94	0.96	0.96	0.96	0.95	0.98	0.98	0.96	0.94	0.98	0.95	0.97	0.95	0.95	0.95	0.95	0.87	5.11					
POL	0.95	0.95	0.95	0.96	0.96	0.96	0.95	0.95	0.94	0.96	0.90	0.94	0.96	0.93	0.94	0.94	0.86	0.96	9.87				
PRT	0.89	0.93	0.91	0.91	0.94	0.92	0.92	0.92	0.90	0.90	0.89	0.90	0.93	0.90	0.92	0.91	0.84	0.90	0.89	0.45			
SVN	0.82	0.88	0.89	0.89	0.91	0.92	0.91	0.90	0.88	0.88	0.84	0.85	0.91	0.82	0.89	0.85	0.77	0.90	0.91	0.84	16.94		
USA	0.94	0.95	0.97	0.96	0.94	0.96	0.97	0.97	0.94	0.98	0.91	0.97	0.97	0.95	0.97	0.97	0.91	0.97	0.95	0.91	0.89	1.49	
ZAF	0.95	0.96	0.98	0.95	0.97	0.97	0.95	0.97	0.93	0.96	0.88	0.98	0.97	0.97	0.95	0.96	0.88	0.96	0.95	0.92	0.87	0.97	11.90

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HOL     ftp
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	AUS	BEL	CAN	CHE	CZE	DEU	DFS	ESP	EST	FRA	FRR	GBR	HUN	IRL	ITA	JPN	KOR	NLD	NZL	POL	PRT	SVN	USA	ZAF
AUS	5.40																							
BEL	0.94	1.42																						
CAN	0.96	0.95	5.95																					
CHE	0.97	0.96	0.97	11.79																				
CZE	0.95	0.93	0.96	0.95	12.86																			
DEU	0.95	0.92	0.98	0.96	0.95	13.73																		
DFS	0.91	0.95	0.96	0.95	0.92	0.95	10.83																	
ESP	0.94	0.90	0.97	0.95	0.95	0.96	0.91	1.00																
EST	0.87	0.88	0.91	0.86	0.90	0.90	0.89	0.89	13.10															
FRA	0.94	0.98	0.96	0.97	0.93	0.95	0.96	0.92	0.89	1.12														
FRR	0.84	0.90	0.91	0.91	0.88	0.92	0.90	0.89	0.84	0.91	0.10													
GBR	0.95	0.89	0.97	0.94	0.92	0.96	0.93	0.96	0.87	0.91	0.86	1.23												
HUN	0.97	0.92	0.97	0.95	0.97	0.96	0.91	0.97	0.89	0.94	0.87	0.94	1.02											
IRL	0.95	0.87	0.96	0.93	0.90	0.95	0.91	0.94	0.84	0.90	0.83	0.99	0.93	1.37										
ITA	0.82	0.80	0.88	0.81	0.81	0.85	0.86	0.85	0.79	0.82	0.81	0.88	0.86	0.86	1.24									
JPN	0.95	0.97	0.96	0.97	0.94	0.95	0.95	0.93	0.90	0.98	0.88	0.91	0.94	0.90	0.79	1.43								
KOR	0.92	0.92	0.91	0.92	0.92	0.91	0.92	0.90	0.83	0.92	0.83	0.87	0.93	0.86	0.80	0.92	3.75							
NLD	0.93	0.94	0.97	0.95	0.94	0.98	0.96	0.94	0.92	0.96	0.92	0.94	0.92	0.93	0.85	0.96	0.89	4.79						
NZL	0.93	0.88	0.90	0.89	0.88	0.88	0.87	0.88	0.79	0.90	0.78	0.91	0.89	0.90	0.79	0.89	0.84	0.88	0.30					
POL	0.91	0.87	0.94	0.90	0.91	0.95	0.91	0.92	0.88	0.90	0.86	0.93	0.93	0.91	0.87	0.91	0.86	0.94	0.85	9.58				
PRT	0.92	0.86	0.93	0.89	0.92	0.93	0.87	0.92	0.88	0.84	0.84	0.93	0.93	0.92	0.81	0.88	0.89	0.89	0.81	0.91	0.45			
SVN	0.90	0.89	0.93	0.91	0.89	0.94	0.89	0.94	0.87	0.90	0.85	0.92	0.91	0.90	0.82	0.91	0.87	0.92	0.83	0.91	0.90	18.14		
USA	0.88	0.86	0.94	0.88	0.88	0.92	0.93	0.92	0.83	0.88	0.84	0.95	0.90	0.93	0.90	0.86	0.85	0.91	0.88	0.90	0.88	0.88	1.41	
ZAF	0.95	0.91	0.97	0.95	0.95	0.94	0.92	0.95	0.86	0.93	0.85	0.95	0.96	0.94	0.87	0.93	0.90	0.94	0.89	0.90	0.89	0.87	0.90	10.69

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HOL     ftl
--------------------------------------------------------------------------------
         AUS     BEL     CAN     CHE     CZE     DEU     DFS     ESP     EST     FRA     FRR
GBR      HUN     IRL     ITA     JPN     KOR     NLD     POL     PRT     SVN     USA     ZAF
AUS      5.93
BEL      0.96    1.54
CAN      0.95    0.92    5.73
CHE      0.94    0.94    0.90   11.63
CZE      0.95    0.96    0.92    0.96   14.29
DEU      0.96    0.98    0.94    0.94    0.97   13.53
DFS      0.97    0.97    0.94    0.97    0.98    0.98   10.89
ESP      0.97    0.98    0.94    0.95    0.97    0.98    0.97    1.13
EST      0.92    0.92    0.90    0.92    0.95    0.95    0.95    0.93   13.78
FRA      0.95    0.90    0.98    0.88    0.90    0.93    0.92    0.92    0.89    1.07
FRR      0.89    0.94    0.90    0.92    0.93    0.95    0.94    0.93    0.89    0.88    0.14
GBR      0.96    0.97    0.95    0.94    0.97    0.98    0.97    0.97    0.92    0.94    0.94
1.33
HUN      0.94    0.97    0.89    0.96    0.96    0.96    0.96    0.96    0.94    0.85    0.90
0.93    0.96
IRL      0.96    0.96    0.95    0.92    0.96    0.98    0.95    0.96    0.92    0.94    0.92
0.99    0.92    1.75
ITA      0.91    0.91    0.92    0.91    0.91    0.93    0.93    0.93    0.88    0.91    0.90
0.96    0.87    0.95    1.62
JPN      0.97    0.98    0.94    0.96    0.97    0.98    0.98    0.98    0.94    0.93    0.92
0.97    0.96    0.96    0.94    1.49
KOR      0.92    0.95    0.88    0.93    0.94    0.94    0.94    0.94    0.89    0.85    0.89
0.92    0.93    0.90    0.87    0.96    5.06
NLD      0.96    0.98    0.93    0.95    0.97    0.98    0.97    0.98    0.94    0.90    0.93
0.97    0.97    0.96    0.92    0.98    0.94    5.00
POL      0.97    0.96    0.92    0.96    0.97    0.97    0.97    0.97    0.96    0.90    0.92
0.96    0.97    0.96    0.91    0.97    0.93    0.97   11.96
PRT      0.91    0.93    0.91    0.93    0.94    0.95    0.94    0.94    0.92    0.87    0.92
0.94    0.93    0.94    0.88    0.93    0.93    0.95    0.95    0.36
SVN      0.92    0.94    0.89    0.93    0.94    0.95    0.95    0.96    0.89    0.86    0.89
0.94    0.93    0.93    0.90    0.94    0.91    0.95    0.94    0.91   18.14
USA      0.95    0.94    0.96    0.92    0.95    0.96    0.96    0.96    0.91    0.94    0.92
0.97    0.91    0.96    0.95    0.97    0.92    0.95    0.95    0.93    0.92    1.47
ZAF      0.96    0.96    0.90    0.95    0.96    0.94    0.96    0.96    0.90    0.87    0.88
0.95    0.95    0.94    0.92    0.96    0.92    0.95    0.96    0.88    0.93    0.94   11.02
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HOL    rtp
--------------------------------------------------------------------------------
         AUS     BEL     CAN     CHE     CZE     DEU     DFS     ESP     EST     FRA     FRR
GBR    IRL     ITA     JPN     KOR     NLD     NZL     POL     PRT     SVN     USA     ZAF
AUS      5.55
BEL      0.96    1.41
CAN      0.97    0.96    6.07
CHE      0.96    0.97    0.98   11.81
CZE      0.91    0.95    0.94    0.92   13.93
DEU      0.94    0.96    0.97    0.96    0.97   13.74
DFS      0.92    0.94    0.96    0.95    0.94    0.97   10.99
ESP      0.94    0.96    0.97    0.95    0.95    0.97    0.96    0.95
EST      0.91    0.93    0.93    0.91    0.94    0.96    0.92    0.93   13.24
FRA      0.96    0.97    0.97    0.97    0.95    0.97    0.96    0.97    0.93    1.06
FRR      0.82    0.83    0.81    0.82    0.79    0.81    0.79    0.77    0.80    0.84    0.10
GBR      0.96    0.95    0.97    0.95    0.95    0.97    0.97    0.96    0.94    0.98    0.83
1.32
IRL      0.94    0.94    0.96    0.95    0.92    0.95    0.95    0.94    0.89    0.96    0.82
0.97    1.27
ITA      0.85    0.90    0.88    0.88    0.90    0.94    0.93    0.91    0.90    0.91    0.75
0.91    0.88    1.28
JPN      0.96    0.97    0.98    0.97    0.94    0.97    0.97    0.97    0.93    0.98    0.78
0.97    0.95    0.90    1.55
KOR      0.88    0.90    0.92    0.91    0.89    0.93    0.94    0.95    0.87    0.94    0.74
0.92    0.90    0.93    0.94    2.55
NLD      0.95    0.95    0.97    0.96    0.94    0.98    0.97    0.97    0.94    0.97    0.77
0.97    0.95    0.91    0.97    0.93    4.85
NZL      0.96    0.94    0.94    0.94    0.93    0.95    0.92    0.92    0.90    0.95    0.78
0.95    0.94    0.88    0.94    0.87    0.93    0.45
POL      0.89    0.93    0.93    0.92    0.96    0.97    0.94    0.96    0.93    0.95    0.73
0.94    0.91    0.91    0.95    0.92    0.95    0.92   10.60
PRT      0.87    0.90    0.91    0.87    0.93    0.93    0.91    0.92    0.89    0.92    0.80
0.93    0.92    0.88    0.92    0.91    0.90    0.87    0.92    0.48
SVN      0.88    0.90    0.90    0.90    0.90    0.93    0.87    0.94    0.88    0.90    0.74
0.89    0.87    0.87    0.88    0.88    0.89    0.88    0.91    0.88   15.67
USA      0.92    0.92    0.94    0.91    0.93    0.95    0.96    0.95    0.91    0.94    0.80
0.97    0.93    0.90    0.95    0.93    0.95    0.89    0.92    0.92    0.86    1.63
ZAF      0.90    0.89    0.91    0.85    0.86    0.89    0.85    0.88    0.86    0.87    0.75
0.86    0.85    0.81    0.89    0.83    0.87    0.86    0.84    0.84    0.83    0.87    7.81
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HOL    ocs
--------------------------------------------------------------------------------
          AUS     BEL     CAN     CHE     CZE     DEU     DFS     ESP     EST     FRA     FRR
GBR     HUN     IRL     ITA     JPN     KOR     NLD     NZL     POL     PRT     SVN     USA
AUS      6.36
BEL      0.59    1.23
CAN      0.58    0.71    5.42
CHE      0.52    0.79    0.92   11.64
CZE      0.64    0.63    0.84    0.78   15.41
DEU      0.62    0.61    0.86    0.83    0.88   13.04
DFS      0.64    0.65    0.81    0.78    0.78    0.87   10.30
ESP      0.66    0.63    0.81    0.76    0.78    0.87    0.86    0.89
EST      0.50    0.59    0.75    0.62    0.75    0.78    0.65    0.61   13.50
FRA      0.58    0.73    0.80    0.84    0.75    0.84    0.86    0.86    0.65    1.12
FRR      0.62    0.73    0.63    0.67    0.70    0.79    0.75    0.74    0.66    0.76    0.10
GBR      0.69    0.71    0.87    0.88    0.83    0.92    0.88    0.87    0.64    0.90    0.79
0.94
HUN      0.53    0.73    0.83    0.83    0.85    0.84    0.76    0.79    0.70    0.82    0.70
0.83    1.01
IRL      0.63    0.48    0.72    0.69    0.72    0.77    0.67    0.70    0.58    0.63    0.56
0.77    0.70    1.06
ITA      0.58    0.63    0.82    0.79    0.75    0.82    0.81    0.85    0.66    0.87    0.77
0.86    0.80    0.67    0.82
JPN      0.52    0.79    0.88    0.90    0.66    0.76    0.79    0.78    0.60    0.85    0.69
0.83    0.71    0.55    0.83    0.71
KOR      0.51    0.45    0.51    0.54    0.40    0.53    0.50    0.59    0.45    0.57    0.55
0.52    0.49    0.43    0.63    0.59    7.25
NLD      0.62    0.69    0.81    0.81    0.79    0.89    0.89    0.87    0.72    0.86    0.80
0.90    0.76    0.62    0.81    0.81    0.52    3.02
NZL      0.81    0.54    0.66    0.64    0.74    0.67    0.59    0.64    0.46    0.59    0.49
0.72    0.55    0.57    0.54    0.57    0.35    0.66    0.32
POL      0.43    0.59    0.54    0.56    0.54    0.55    0.63    0.63    0.39    0.69    0.74
0.64    0.62    0.40    0.65    0.70    0.57    0.62    0.37    7.09
PRT      0.54    0.63    0.69    0.69    0.71    0.79    0.79    0.76    0.66    0.74    0.76
0.78    0.69    0.61    0.76    0.69    0.59    0.76    0.41    0.55    0.58
SVN      0.39    0.50    0.55    0.51    0.57    0.67    0.59    0.72    0.51    0.70    0.65
0.58    0.60    0.40    0.66    0.64    0.54    0.60    0.38    0.68    0.68   20.34
USA      0.64    0.66    0.87    0.83    0.80    0.89    0.88    0.87    0.66    0.86    0.72
0.91    0.80    0.70    0.85    0.85    0.56    0.88    0.70    0.64    0.73    0.64    0.91
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	AUS	BEL	CAN	CHE	CZE	DEU	DFS	ESP	EST	FRA	FRR	GBR	HUN	IRL	ITA	JPN	NLD	NZL	POL	PRT	SVN	USA
AUS	4.33																					
BEL	0.57	1.34																				
CAN	0.66	0.77	5.37																			
CHE	0.66	0.85	0.93	11.57																		
CZE	0.58	0.83	0.89	0.90	17.21																	
DEU	0.65	0.79	0.90	0.88	0.93	13.53																
DFS	0.43	0.82	0.86	0.90	0.91	0.88	12.76															
ESP	0.61	0.70	0.86	0.86	0.85	0.87	0.85	1.06														
EST	0.50	0.74	0.79	0.74	0.84	0.82	0.86	0.77	13.73													
FRA	0.55	0.81	0.85	0.91	0.91	0.89	0.94	0.86	0.84	1.03												
FRR	0.56	0.81	0.68	0.74	0.76	0.85	0.73	0.76	0.64	0.75	0.10											
GBR	0.80	0.65	0.84	0.84	0.77	0.86	0.68	0.86	0.64	0.75	0.71	1.12										
HUN	0.59	0.82	0.86	0.89	0.91	0.88	0.86	0.86	0.78	0.83	0.70	0.75	1.12									
IRL	0.83	0.62	0.78	0.79	0.70	0.79	0.61	0.79	0.57	0.69	0.63	0.96	0.71	1.01								
ITA	0.65	0.71	0.89	0.88	0.86	0.86	0.83	0.94	0.78	0.88	0.71	0.85	0.83	0.78	1.03							
JPN	0.71	0.83	0.92	0.89	0.82	0.87	0.79	0.80	0.74	0.83	0.73	0.87	0.76	0.82	0.87	0.76						
NLD	0.62	0.84	0.89	0.92	0.88	0.91	0.87	0.87	0.80	0.91	0.83	0.84	0.81	0.76	0.86	0.87	4.88					
NZL	0.77	0.75	0.82	0.88	0.78	0.81	0.76	0.74	0.66	0.83	0.61	0.81	0.77	0.81	0.76	0.81	0.83	0.43				
POL	0.66	0.77	0.69	0.76	0.75	0.77	0.68	0.65	0.66	0.69	0.70	0.75	0.66	0.76	0.68	0.77	0.73	0.74	8.08			
PRT	0.71	0.74	0.79	0.78	0.79	0.80	0.72	0.79	0.68	0.75	0.73	0.78	0.74	0.77	0.79	0.78	0.79	0.73	0.71	0.95		
SVN	0.44	0.52	0.48	0.44	0.48	0.51	0.40	0.41	0.48	0.42	0.43	0.41	0.39	0.44	0.43	0.53	0.53	0.49	0.62	0.56	21.00	
USA	0.68	0.77	0.93	0.91	0.85	0.89	0.86	0.92	0.81	0.88	0.73	0.89	0.83	0.83	0.94	0.92	0.90	0.85	0.71	0.80	0.48	1.15

```
--------------------------------------------------------------------------------
HOL     ofl
--------------------------------------------------------------------------------
          AUS       BEL       CAN       CHE       CZE       DEU       DFS       ESP       EST       FRA       GBR
HUN       IRL       ITA       JPN       NLD       POL       PRT       SVN       USA
AUS      5.82
BEL      0.48      1.78
CAN      0.29      0.76      6.19
CHE      0.35      0.81      0.89     11.45
CZE      0.43      0.78      0.81      0.72     15.89
DEU      0.31      0.74      0.85      0.76      0.79     11.90
DFS      0.31      0.67      0.87      0.79      0.59      0.79     13.12
ESP      0.27      0.71      0.82      0.73      0.61      0.74      0.83      0.98
EST      0.36      0.65      0.55      0.43      0.66      0.62      0.55      0.65     15.27
FRA      0.32      0.77      0.67      0.64      0.65      0.74      0.60      0.72      0.72      1.08
GBR      0.32      0.74      0.79      0.77      0.68      0.77      0.71      0.82      0.58      0.82      1.24
HUN      0.46      0.71      0.60      0.59      0.79      0.66      0.40      0.57      0.66      0.76      0.66
1.08
IRL      0.40      0.79      0.79      0.83      0.72      0.72      0.70      0.74      0.50      0.68      0.84
0.70      1.47
ITA      0.33      0.70      0.70      0.64      0.75      0.71      0.54      0.67      0.66      0.78      0.73
0.75      0.69      1.66
JPN      0.34      0.66      0.87      0.80      0.74      0.76      0.72      0.67      0.54      0.57      0.64
0.53      0.71      0.69      0.64
NLD      0.30      0.81      0.67      0.62      0.62      0.72      0.59      0.65      0.72      0.81      0.76
0.69      0.68      0.66      0.56      5.13
POL      0.45      0.76      0.74      0.70      0.86      0.74      0.53      0.62      0.64      0.69      0.67
0.70      0.69      0.75      0.73      0.55     11.37
PRT      0.27      0.58      0.52      0.38      0.64      0.63      0.47      0.62      0.81      0.75      0.65
0.68      0.47      0.68      0.50      0.70      0.49      0.40
SVN      0.49      0.59      0.62      0.52      0.67      0.55      0.48      0.52      0.61      0.62      0.51
0.70      0.49      0.65      0.65      0.66      0.53      0.71     26.25
USA      0.41      0.75      0.83      0.73      0.84      0.75      0.66      0.73      0.66      0.72      0.75
0.72      0.73      0.76      0.86      0.67      0.81      0.65      0.75      1.58


--------------------------------------------------------------------------------
HOL     loc
--------------------------------------------------------------------------------
          BEL       CAN       CHE       CZE       DEU       DFS       ESP       FRA       GBR       IRL       ITA
KOR       NLD       PRT       SVN       USA
BEL      1.89
CAN      0.84      6.42
CHE      0.58      0.63     11.77
CZE      0.33      0.51      0.52     22.67
DEU      0.62      0.73      0.67      0.65     11.93
DFS      0.85      0.91      0.55      0.49      0.67     12.96
ESP      0.53      0.69      0.70      0.56      0.78      0.69      0.99
FRA      0.76      0.75      0.70      0.61      0.82      0.69      0.72      1.08
GBR      0.61      0.66      0.86      0.62      0.79      0.60      0.78      0.84      1.30
IRL      0.61      0.63      0.67      0.41      0.69      0.57      0.71      0.73      0.78      1.68
ITA      0.57      0.67      0.65      0.63      0.71      0.56      0.70      0.76      0.75      0.63      1.91
KOR      0.55      0.76      0.52      0.58      0.52      0.73      0.64      0.62      0.63      0.59      0.57
11.61
NLD      0.83      0.77      0.64      0.44      0.83      0.76      0.66      0.80      0.72      0.64      0.60
0.50      4.72
PRT      0.28      0.49      0.47      0.65      0.61      0.43      0.55      0.52      0.59      0.43      0.50
0.52      0.49      0.23
SVN      0.66      0.72      0.64      0.69      0.64      0.73      0.68      0.71      0.68      0.49      0.72
0.67      0.71      0.61     29.51
USA      0.54      0.71      0.53      0.70      0.78      0.65      0.71      0.75      0.70      0.66      0.80
0.56      0.60      0.47      0.64      1.58
```

```
--------------------------------------------------------------------------------
HOL     bcs
--------------------------------------------------------------------------------
          BEL     CAN     CHE     CZE     DEU     DFS     ESP     FRA     FRR     GBR     IRL
ITA     JPN     KOR     NLD     PRT     USA
BEL      1.11
CAN      0.76    6.15
CHE      0.70    0.93   11.78
CZE      0.76    0.92    0.87   12.66
DEU      0.75    0.93    0.91    0.95   13.01
DFS      0.76    0.93    0.88    0.93    0.95   12.18
ESP      0.79    0.95    0.89    0.93    0.94    0.94    1.12
FRA      0.74    0.94    0.94    0.91    0.93    0.94    0.95    1.01
FRR      0.70    0.77    0.84    0.75    0.81    0.73    0.82    0.81    0.08
GBR      0.75    0.96    0.92    0.87    0.90    0.86    0.94    0.94    0.83    1.26
IRL      0.66    0.91    0.89    0.80    0.83    0.82    0.88    0.89    0.76    0.95    1.08
ITA      0.73    0.93    0.91    0.94    0.95    0.94    0.93    0.95    0.77    0.90    0.83
6.64
JPN      0.75    0.97    0.92    0.92    0.94    0.95    0.94    0.96    0.75    0.92    0.87
0.95    1.62
KOR      0.60    0.78    0.78    0.76    0.78    0.80    0.83    0.80    0.60    0.76    0.68
0.81    0.81    2.67
NLD      0.74    0.95    0.93    0.93    0.95    0.95    0.94    0.95    0.85    0.91    0.87
0.93    0.94    0.73    4.91
PRT      0.71    0.89    0.88    0.88    0.87    0.86    0.89    0.89    0.75    0.86    0.77
0.89    0.87    0.78    0.89    0.36
USA      0.79    0.76    0.66    0.70    0.73    0.76    0.75    0.76    0.58    0.75    0.64
0.76    0.77    0.64    0.71    0.72    1.38


--------------------------------------------------------------------------------
JER     sta
--------------------------------------------------------------------------------
          AUS     CAN     DFS     GBR     ITA     NLD     NZL     USA     ZAF
AUS      6.10
CAN      0.85    6.14
DFS      0.86    0.95   11.93
GBR      0.88    0.94    0.93    1.01
ITA      0.87    0.95    0.91    0.96    1.20
NLD      0.89    0.95    0.96    0.94    0.93    4.94
NZL      0.88    0.87    0.85    0.93    0.90    0.85    0.36
USA      0.89    0.97    0.94    0.96    0.94    0.94    0.90    1.39
ZAF      0.81    0.86    0.84    0.94    0.93    0.87    0.94    0.90    9.63


--------------------------------------------------------------------------------
JER     cwi
--------------------------------------------------------------------------------
          AUS     CAN     DFS     GBR     ITA     NLD     NZL     USA     ZAF
AUS      5.46
CAN      0.68    6.58
DFS      0.81    0.82   15.46
GBR      0.76    0.87    0.82    1.62
ITA      0.60    0.90    0.75    0.77    1.35
NLD      0.72    0.80    0.90    0.77    0.73    4.38
NZL      0.82    0.59    0.69    0.79    0.52    0.64    0.36
USA      0.74    0.93    0.78    0.81    0.92    0.83    0.58    0.94
ZAF      0.83    0.83    0.71    0.88    0.72    0.75    0.80    0.83    9.39


--------------------------------------------------------------------------------
JER     bde
--------------------------------------------------------------------------------
          AUS     CAN     DFS     GBR     ITA     NLD     NZL     ZAF
AUS      5.33
CAN      0.75    5.90
DFS      0.84    0.86   13.54
GBR      0.68    0.79    0.79    1.59
ITA      0.51    0.70    0.73    0.83    1.36
NLD      0.63    0.84    0.85    0.77    0.84    3.28
NZL      0.75    0.60    0.64    0.66    0.64    0.52    0.36
ZAF      0.92    0.73    0.83    0.76    0.59    0.62    0.77    9.81
```

```
----------------------------------------------------------------------------------
JER    ang
----------------------------------------------------------------------------------
           AUS     CAN     DFS     GBR     ITA     NLD     USA     ZAF
AUS       6.46
CAN       0.57    7.19
DFS       0.69    0.76   13.34
GBR       0.85    0.69    0.87    1.15
ITA       0.70    0.72    0.85    0.87    1.28
NLD       0.76    0.68    0.64    0.76    0.63    3.27
USA       0.80    0.79    0.87    0.84    0.77    0.74    0.99
ZAF       0.71    0.64    0.79    0.87    0.75    0.59    0.79    9.59


----------------------------------------------------------------------------------
JER    ran
----------------------------------------------------------------------------------
           AUS     CAN     DFS     GBR     ITA     NLD     NZL     USA     ZAF
AUS       5.80
CAN       0.88    5.78
DFS       0.89    0.95   11.52
GBR       0.96    0.94    0.95    1.22
ITA       0.85    0.95    0.93    0.90    1.46
NLD       0.88    0.90    0.94    0.94    0.85    4.74
NZL       0.96    0.84    0.86    0.92    0.82    0.85    0.29
USA       0.92    0.93    0.94    0.97    0.90    0.94    0.91    1.12
ZAF       0.97    0.89    0.90    0.97    0.84    0.91    0.92    0.95   10.18


----------------------------------------------------------------------------------
JER    rwi
----------------------------------------------------------------------------------
           AUS     CAN     DFS     GBR     ITA     NLD     NZL     USA     ZAF
AUS       6.06
CAN       0.87    6.47
DFS       0.79    0.87   11.93
GBR       0.80    0.94    0.86    1.38
ITA       0.65    0.79    0.79    0.76    1.44
NLD       0.80    0.77    0.87    0.65    0.65    4.23
NZL       0.89    0.85    0.80    0.79    0.65    0.80    0.28
USA       0.55    0.76    0.66    0.79    0.82    0.52    0.54    0.82
ZAF       0.78    0.77    0.69    0.80    0.57    0.65    0.70    0.61   10.50


----------------------------------------------------------------------------------
JER    rls
----------------------------------------------------------------------------------
           AUS     CAN     DFS     GBR     ITA     NLD     NZL     USA     ZAF
AUS       7.36
CAN       0.47    5.72
DFS       0.54    0.92   12.99
GBR       0.70    0.82    0.77    1.74
ITA       0.43    0.76    0.79    0.77    1.57
NLD       0.60    0.83    0.89    0.77    0.88    3.64
NZL       0.69    0.57    0.55    0.75    0.71    0.64    0.12
USA       0.60    0.90    0.90    0.90    0.82    0.83    0.72    0.68
ZAF       0.88    0.66    0.64    0.87    0.67    0.69    0.86    0.82   13.50


----------------------------------------------------------------------------------
JER    rlr
----------------------------------------------------------------------------------
           AUS     CAN     DFS     ITA     NLD     ZAF
AUS       7.71
CAN       0.33    7.03
DFS       0.53    0.77   12.78
ITA       0.42    0.52    0.56    1.12
NLD       0.61    0.75    0.86    0.78    5.11
ZAF       0.29    0.38    0.55    0.73    0.68   14.38
```

```
--------------------------------------------------------------------------------
JER     fan
--------------------------------------------------------------------------------
          AUS     CAN     DFS     GBR     ITA     NLD     USA     ZAF
AUS      6.89
CAN      0.66    5.53
DFS      0.67    0.86    12.84
GBR      0.78    0.80     0.72    1.36
ITA      0.54    0.79     0.63    0.81    1.78
NLD      0.68    0.82     0.77    0.89    0.80    4.93
USA      0.67    0.88     0.78    0.85    0.86    0.83    0.76
ZAF      0.77    0.72     0.76    0.90    0.78    0.81    0.82    10.85


--------------------------------------------------------------------------------
JER     fua
--------------------------------------------------------------------------------
          AUS     CAN     DFS     GBR     ITA     NLD     NZL     USA     ZAF
AUS      5.85
CAN      0.66    5.13
DFS      0.80    0.83    12.71
GBR      0.77    0.92     0.82    1.59
ITA      0.62    0.84     0.79    0.85    1.50
NLD      0.80    0.82     0.91    0.88    0.82    5.03
NZL      0.84    0.62     0.70    0.77    0.57    0.79    0.40
USA      0.77    0.93     0.85    0.92    0.85    0.84    0.68    1.16
ZAF      0.74    0.91     0.85    0.95    0.88    0.86    0.71    0.92    12.60


--------------------------------------------------------------------------------
JER     ruh
--------------------------------------------------------------------------------
          AUS     CAN     DFS     GBR     ITA     NLD     NZL     USA     ZAF
AUS      5.36
CAN      0.68    6.96
DFS      0.72    0.88    11.18
GBR      0.82    0.84     0.83    1.16
ITA      0.77    0.85     0.82    0.90    1.35
NLD      0.76    0.85     0.92    0.89    0.87    4.64
NZL      0.70    0.71     0.79    0.70    0.80    0.76    0.40
USA      0.80    0.85     0.88    0.88    0.85    0.84    0.72    1.12
ZAF      0.83    0.76     0.84    0.83    0.81    0.77    0.75    0.90    10.04


--------------------------------------------------------------------------------
JER     usu
--------------------------------------------------------------------------------
          AUS     CAN     DFS     GBR     ITA     NLD     NZL     USA     ZAF
AUS      5.38
CAN      0.83    6.52
DFS      0.74    0.86    12.85
GBR      0.85    0.90     0.84    1.69
ITA      0.49    0.70     0.65    0.58    1.57
NLD      0.79    0.81     0.88    0.75    0.76    5.23
NZL      0.50    0.50     0.39    0.60    0.57    0.53    0.38
USA      0.73    0.85     0.87    0.77    0.63    0.84    0.31    0.83
ZAF      0.84    0.88     0.80    0.85    0.60    0.76    0.39    0.83    11.43


--------------------------------------------------------------------------------
JER     ude
--------------------------------------------------------------------------------
          AUS     CAN     DFS     GBR     ITA     NLD     USA     ZAF
AUS      5.41
CAN      0.94    4.84
DFS      0.93    0.93    12.22
GBR      0.93    0.94     0.92    1.56
ITA      0.95    0.93     0.93    0.88    1.42
NLD      0.94    0.94     0.95    0.92    0.95    4.59
USA      0.93    0.97     0.95    0.92    0.93    0.92    1.52
ZAF      0.96    0.94     0.93    0.93    0.95    0.92    0.95    11.76
```

```
--------------------------------------------------------------------------------
JER    ftp
--------------------------------------------------------------------------------
         AUS     CAN     DFS     GBR     ITA     NLD     NZL     USA     ZAF
AUS      6.08
CAN      0.88    5.88
DFS      0.86    0.94   13.03
GBR      0.89    0.88    0.88    1.40
ITA      0.61    0.77    0.79    0.61    1.66
NLD      0.92    0.96    0.95    0.89    0.76    5.34
NZL      0.90    0.91    0.85    0.84    0.71    0.87    0.30
USA      0.86    0.95    0.94    0.87    0.76    0.91    0.87    1.12
ZAF      0.88    0.96    0.91    0.91    0.71    0.91    0.90    0.94   11.24


--------------------------------------------------------------------------------
JER    ftl
--------------------------------------------------------------------------------
         AUS     CAN     DFS     GBR     ITA     NLD     USA     ZAF
AUS      6.46
CAN      0.77    5.35
DFS      0.91    0.86   13.84
GBR      0.95    0.85    0.93    1.39
ITA      0.89    0.69    0.87    0.91    1.67
NLD      0.93    0.89    0.96    0.95    0.87    4.94
USA      0.93    0.85    0.94    0.95    0.91    0.95    1.02
ZAF      0.95    0.82    0.91    0.94    0.90    0.93    0.97   11.25


--------------------------------------------------------------------------------
JER    rtp
--------------------------------------------------------------------------------
         AUS     CAN     DFS     NLD     NZL     ZAF
AUS      5.91
CAN      0.94    6.15
DFS      0.89    0.94   13.03
NLD      0.81    0.86    0.95    4.46
NZL      0.95    0.95    0.89    0.85    0.39
ZAF      0.93    0.97    0.91    0.79    0.92   10.53


--------------------------------------------------------------------------------
JER    ocs
--------------------------------------------------------------------------------
         AUS     CAN     DFS     GBR     ITA     NLD     NZL     USA
AUS      6.05
CAN      0.45    5.86
DFS      0.48    0.66   12.98
GBR      0.67    0.84    0.74    1.92
ITA      0.38    0.80    0.59    0.72    0.76
NLD      0.57    0.79    0.85    0.81    0.84    2.71
NZL      0.61    0.61    0.44    0.58    0.58    0.60    0.33
USA      0.69    0.78    0.63    0.81    0.68    0.79    0.62    0.92


--------------------------------------------------------------------------------
JER    ous
--------------------------------------------------------------------------------
         AUS     CAN     DFS     GBR     NLD     NZL     USA
AUS      5.04
CAN      0.67    6.11
DFS      0.44    0.87   12.65
GBR      0.73    0.86    0.74    1.33
NLD      0.63    0.88    0.86    0.79    4.61
NZL      0.65    0.77    0.73    0.76    0.80    0.45
USA      0.66    0.90    0.82    0.86    0.90    0.67    0.70
```

```
--------------------------------------------------------------------------------
JER     ofl
--------------------------------------------------------------------------------
          AUS     CAN     DFS     GBR     ITA     NLD     USA
AUS      6.90
CAN      0.57    5.89
DFS      0.36    0.80   13.85
GBR      0.57    0.75    0.51    1.31
ITA      0.61    0.77    0.59    0.68    1.16
NLD      0.45    0.71    0.60    0.72    0.71    5.88
USA      0.67    0.85    0.57    0.74    0.79    0.67    0.96


--------------------------------------------------------------------------------
RDC     sta
--------------------------------------------------------------------------------
          AUS     CAN     DEU     DFS     GBR     NLD     NOR     NZL     USA
AUS     10.98
CAN      0.87    5.96
DEU      0.89    0.95   12.25
DFS      0.87    0.96    0.96    8.80
GBR      0.90    0.91    0.94    0.87    1.18
NLD      0.86    0.95    0.97    0.96    0.92    4.54
NOR      0.87    0.90    0.93    0.95    0.88    0.93   11.89
NZL      0.89    0.89    0.84    0.88    0.88    0.81    0.87    0.47
USA      0.88    0.97    0.94    0.93    0.93    0.92    0.87    0.87    2.00


--------------------------------------------------------------------------------
RDC     cwi
--------------------------------------------------------------------------------
          AUS     CAN     DEU     DFS     GBR     NLD     NZL     USA
AUS      6.75
CAN      0.67    7.15
DEU      0.69    0.84   11.15
DFS      0.76    0.84    0.88   12.83
GBR      0.78    0.82    0.90    0.82    1.49
NLD      0.66    0.89    0.93    0.89    0.91    3.70
NZL      0.79    0.59    0.73    0.71    0.77    0.66    0.35
USA      0.53    0.86    0.81    0.77    0.81    0.82    0.69    1.06


--------------------------------------------------------------------------------
RDC     bde
--------------------------------------------------------------------------------
          AUS     CAN     DEU     DFS     GBR     NLD     NOR     NZL     USA
AUS      7.98
CAN      0.78    5.94
DEU      0.79    0.88    9.40
DFS      0.84    0.84    0.92   11.73
GBR      0.77    0.81    0.90    0.82    1.41
NLD      0.68    0.84    0.91    0.84    0.90    4.16
NOR      0.77    0.65    0.78    0.81    0.63    0.64   11.77
NZL      0.80    0.57    0.70    0.79    0.68    0.53    0.74    0.35
USA      0.63    0.77    0.86    0.78    0.88    0.88    0.64    0.65    0.99


--------------------------------------------------------------------------------
RDC     ang
--------------------------------------------------------------------------------
          AUS     CAN     DEU     DFS     GBR     NLD     USA
AUS      8.29
CAN      0.63    6.77
DEU      0.62    0.85   12.07
DFS      0.63    0.81    0.86    9.25
GBR      0.74    0.78    0.81    0.79    1.30
NLD      0.67    0.72    0.48    0.63    0.76    5.42
USA      0.71    0.86    0.85    0.79    0.84    0.66    0.88
```

```
--------------------------------------------------------------------------------
RDC    ran
--------------------------------------------------------------------------------
         AUS     CAN     DEU     DFS     GBR     NLD     NOR     NZL     USA
AUS      8.17
CAN      0.90    5.98
DEU      0.89    0.97    8.27
DFS      0.82    0.95    0.95   10.07
GBR      0.94    0.96    0.96    0.94    1.38
NLD      0.90    0.96    0.98    0.96    0.97    6.04
NOR      0.68    0.84    0.88    0.90    0.80    0.88   11.17
NZL      0.93    0.92    0.89    0.88    0.92    0.89    0.80    0.29
USA      0.91    0.98    0.96    0.95    0.95    0.96    0.85    0.91    1.06


--------------------------------------------------------------------------------
RDC    rwi
--------------------------------------------------------------------------------
         AUS     CAN     DEU     DFS     GBR     NLD     NZL     USA
AUS      7.87
CAN      0.85    5.97
DEU      0.84    0.92    8.47
DFS      0.85    0.93    0.91   10.61
GBR      0.84    0.82    0.89    0.78    1.37
NLD      0.88    0.94    0.94    0.92    0.89    6.02
NZL      0.87    0.88    0.81    0.89    0.81    0.83    0.30
USA      0.77    0.89    0.84    0.86    0.87    0.82    0.84    1.18


--------------------------------------------------------------------------------
RDC    rls
--------------------------------------------------------------------------------
         AUS     CAN     DEU     DFS     GBR     NLD     NOR     NZL     USA
AUS      4.68
CAN      0.65    6.36
DEU      0.73    0.93    8.65
DFS      0.59    0.96    0.92    9.10
GBR      0.83    0.76    0.87    0.74    1.67
NLD      0.73    0.91    0.92    0.87    0.87    5.17
NOR      0.47    0.86    0.88    0.93    0.69    0.73   13.79
NZL      0.65    0.56    0.67    0.57    0.64    0.60    0.58    0.12
USA      0.69    0.94    0.92    0.94    0.80    0.89    0.84    0.53    0.70


--------------------------------------------------------------------------------
RDC    rlr
--------------------------------------------------------------------------------
         AUS     CAN     DEU     DFS     NLD     NOR
AUS      5.19
CAN      0.63    6.74
DEU      0.64    0.88    9.61
DFS      0.64    0.86    0.91   10.73
NLD      0.56    0.86    0.89    0.88    4.58
NOR      0.45    0.75    0.81    0.86    0.88   12.95


--------------------------------------------------------------------------------
RDC    fan
--------------------------------------------------------------------------------
         AUS     CAN     DEU     DFS     GBR     NLD     NOR     USA
AUS      6.08
CAN      0.58    6.58
DEU      0.72    0.83   14.33
DFS      0.68    0.62    0.78    9.48
GBR      0.81    0.76    0.89    0.67    1.70
NLD      0.71    0.78    0.87    0.71    0.88    4.20
NOR      0.48    0.56    0.76    0.54    0.65    0.70   13.91
USA      0.71    0.84    0.83    0.72    0.83    0.80    0.61    0.82
```

```
--------------------------------------------------------------------------------
RDC     fua
--------------------------------------------------------------------------------
          AUS      CAN      DEU      DFS      GBR      NLD      NOR      NZL      USA
AUS      7.90
CAN      0.74     6.01
DEU      0.77     0.88    11.04
DFS      0.75     0.82     0.82    11.83
GBR      0.76     0.82     0.94     0.81     1.66
NLD      0.75     0.91     0.93     0.90     0.92     4.23
NOR      0.71     0.80     0.74     0.86     0.75     0.87    11.06
NZL      0.80     0.78     0.80     0.71     0.76     0.83     0.74     0.34
USA      0.75     0.93     0.89     0.82     0.89     0.88     0.81     0.84     1.13


--------------------------------------------------------------------------------
RDC     ruh
--------------------------------------------------------------------------------
          AUS      CAN      DEU      DFS      GBR      NLD      NOR      NZL      USA
AUS      8.38
CAN      0.77     5.83
DEU      0.79     0.87    13.31
DFS      0.76     0.90     0.91    10.68
GBR      0.85     0.75     0.87     0.81     1.44
NLD      0.78     0.82     0.93     0.93     0.89     5.42
NOR      0.66     0.84     0.83     0.88     0.73     0.86    11.86
NZL      0.84     0.75     0.80     0.75     0.88     0.82     0.66     0.32
USA      0.79     0.87     0.90     0.91     0.88     0.87     0.81     0.84     1.05


--------------------------------------------------------------------------------
RDC     usu
--------------------------------------------------------------------------------
          AUS      CAN      DEU      DFS      GBR      NLD      NOR      NZL      USA
AUS      7.11
CAN      0.77     5.93
DEU      0.72     0.88    11.64
DFS      0.61     0.79     0.79    12.48
GBR      0.82     0.79     0.75     0.69     1.90
NLD      0.79     0.85     0.78     0.89     0.91     4.65
NOR      0.74     0.67     0.70     0.77     0.71     0.85    13.48
NZL      0.74     0.66     0.53     0.40     0.65     0.56     0.63     0.30
USA      0.79     0.85     0.75     0.83     0.85     0.91     0.77     0.69     0.99


--------------------------------------------------------------------------------
RDC     ude
--------------------------------------------------------------------------------
          AUS      CAN      DEU      DFS      GBR      NLD      NOR      USA
AUS      9.08
CAN      0.92     5.58
DEU      0.94     0.96    11.19
DFS      0.92     0.97     0.95    10.57
GBR      0.92     0.92     0.96     0.89     1.82
NLD      0.94     0.96     0.98     0.96     0.96     4.68
NOR      0.85     0.85     0.89     0.91     0.82     0.90    10.94
USA      0.94     0.97     0.96     0.96     0.93     0.97     0.85     1.11


--------------------------------------------------------------------------------
RDC     ftp
--------------------------------------------------------------------------------
          AUS      CAN      DEU      DFS      GBR      NLD      NOR      NZL      USA
AUS      9.33
CAN      0.89     5.17
DEU      0.89     0.95    12.47
DFS      0.84     0.95     0.89    11.82
GBR      0.90     0.89     0.95     0.83     1.52
NLD      0.92     0.97     0.97     0.94     0.94     3.85
NOR      0.75     0.83     0.76     0.90     0.73     0.84    12.12
NZL      0.92     0.88     0.85     0.76     0.86     0.87     0.72     0.26
USA      0.85     0.93     0.92     0.91     0.90     0.91     0.83     0.83     1.13


--------------------------------------------------------------------------------
```

```
RDC     ftl
--------------------------------------------------------------------------------
        AUS     CAN     DEU     DFS     GBR     NLD     NOR     USA
AUS     9.48
CAN     0.88    5.12
DEU     0.95    0.91    12.74
DFS     0.93    0.81    0.96    10.47
GBR     0.94    0.86    0.97    0.91    1.53
NLD     0.96    0.91    0.98    0.95    0.96    4.99
NOR     0.88    0.80    0.91    0.90    0.89    0.92    11.26
USA     0.93    0.89    0.95    0.92    0.94    0.95    0.87    1.11


--------------------------------------------------------------------------------
RDC     rtp
--------------------------------------------------------------------------------
        AUS     CAN     DEU     DFS     NLD     NOR     NZL
AUS     6.89
CAN     0.87    5.99
DEU     0.90    0.96    13.60
DFS     0.85    0.94    0.96    12.47
NLD     0.90    0.97    0.97    0.95    4.53
NOR     0.60    0.71    0.60    0.43    0.63    12.46
NZL     0.90    0.94    0.93    0.90    0.93    0.68    0.34


--------------------------------------------------------------------------------
RDC     ocs
--------------------------------------------------------------------------------
        AUS     CAN     DEU     DFS     GBR     NLD     NOR     NZL     USA
AUS     7.08
CAN     0.62    5.75
DEU     0.65    0.82    17.53
DFS     0.59    0.71    0.70    9.38
GBR     0.69    0.77    0.91    0.71    1.63
NLD     0.64    0.80    0.87    0.86    0.89    3.19
NOR     0.43    0.49    0.74    0.64    0.52    0.64    15.74
NZL     0.72    0.49    0.67    0.69    0.60    0.67    0.72    0.29
USA     0.67    0.83    0.88    0.82    0.83    0.88    0.69    0.71    0.76


--------------------------------------------------------------------------------
RDC     ous
--------------------------------------------------------------------------------
        AUS     CAN     DEU     DFS     GBR     NLD     NOR     NZL     USA
AUS     6.83
CAN     0.70    5.81
DEU     0.69    0.87    14.55
DFS     0.53    0.79    0.82    10.98
GBR     0.79    0.81    0.85    0.63    1.51
NLD     0.65    0.89    0.91    0.87    0.85    4.54
NOR     0.69    0.80    0.73    0.81    0.71    0.83    10.88
NZL     0.76    0.74    0.83    0.76    0.73    0.83    0.74    0.36
USA     0.70    0.93    0.89    0.86    0.86    0.90    0.80    0.82    0.91


--------------------------------------------------------------------------------
RDC     ofl
--------------------------------------------------------------------------------
        AUS     CAN     DEU     DFS     GBR     NLD     NOR     USA
AUS     6.08
CAN     0.24    6.15
DEU     0.37    0.84    14.67
DFS     0.36    0.80    0.77    13.11
GBR     0.31    0.70    0.76    0.57    1.60
NLD     0.34    0.67    0.72    0.56    0.75    6.57
NOR     0.62    0.62    0.72    0.37    0.55    0.74    9.39
USA     0.46    0.71    0.74    0.52    0.71    0.67    0.68    1.01
```

```
---------
^LAPPENDIX II. Number of common bulls
------------------------------------------------------------------------------------------------
---------
BSW
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
        CAN   CHE   DEA   FRA   GBR   ITA   NLD   SVN   USA
  ------------------------------------------------------------------------------
   CAN     0    94    82    61    13    86    34    17   109
   CHE    79     0   430   128    13   371    52    35   235
   DEA    66   341     0   136    10   438    63    51   190
   FRA    54    96   103     0    11   136    46    29    84
   GBR    12    11     9    11     0    13     7     5    14
   ITA    71   321   357   108    11     0    67    51   158
   NLD    26    48    53    37     7    48     0    22    48
   SVN    15    34    47    27     4    49    19     0    18
   USA   102   208   156    57    13   111    36    15     0
  ------------------------------------------------------------------------------
BSW
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
        CAN   CHE   DEA   FRA   GBR   ITA   NLD   SVN   USA
  ------------------------------------------------------------------------------
   CAN     0    86    80    61    13    85    27    16   109
   CHE    73     0   368   113    12   321    47    34   205
   DEA    65   284     0   134     9   408    57    49   172
   FRA    54    82   102     0    11   135    42    28    84
   GBR    12    11     9    11     0    12     7     5    14
   ITA    71   272   325   108    11     0    60    50   157
   NLD    22    45    51    34     7    47     0    22    34
   SVN    14    32    46    26     4    48    19     0    17
   USA   102   179   131    57    13   111    27    14     0
  ------------------------------------------------------------------------------
BSW
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
        CAN   CHE   DEA   FRA   GBR   ITA   NLD   SVN
  ------------------------------------------------------------------------------
   CAN     0    87    80    59    13    81    27    10
   CHE    75     0   429   127    13   369    51    22
   DEA    66   340     0   136    10   436    58    32
   FRA    53    96   103     0    11   135    42    17
   GBR    12    11     9    11     0    13     7     4
   ITA    68   317   355   108    11     0    61    33
   NLD    22    48    52    34     7    47     0    14
   SVN     9    20    30    17     3    30    12     0
  ------------------------------------------------------------------------------
BSW
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
        CAN   CHE   FRA   GBR   NLD   USA
  ------------------------------------------------------------------------------
   CAN     0    93    61    13    14   108
   CHE    79     0   123    13    25   232
   FRA    54    91     0    11    24    84
   GBR    12    11    11     0     3    14
   NLD    11    25    20     3     0    17
   USA   101   208    57    13    14     0
  ------------------------------------------------------------------------------
```

```
BSW
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
       CAN   CHE   DEA   FRA   GBR   ITA   NLD   SVN   USA
 --------------------------------------------------------------------------
   CAN     0    94    82    61    13    86    34    17   109
   CHE    79     0   430   128    13   371    52    35   235
   DEA    66   341     0   136    10   438    63    51   190
   FRA    54    96   103     0    11   136    46    29    84
   GBR    12    11     9    11     0    13     7     5    14
   ITA    71   321   357   108    11     0    67    51   158
   NLD    26    48    53    37     7    48     0    22    48
   SVN    15    34    47    27     4    49    19     0    18
   USA   102   208   156    57    13   111    36    15     0
 --------------------------------------------------------------------------
BSW
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
       CAN   CHE   DEA   FRA   GBR   NLD   SVN   USA
 --------------------------------------------------------------------------
   CAN     0    94    82    61    13    34    10   109
   CHE    79     0   425   127    13    51    22   233
   DEA    66   340     0   136    10    63    32   190
   FRA    54    95   102     0    11    46    17    84
   GBR    12    11     9    11     0     7     4    14
   NLD    26    47    53    37     7     0    14    48
   SVN     9    20    30    17     3    12     0    10
   USA   102   208   156    57    13    36     9     0
 --------------------------------------------------------------------------
BSW
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
       CAN   CHE   DEA   FRA   GBR   ITA   NLD   SVN   USA
 --------------------------------------------------------------------------
   CAN     0    94    82    61    13    86    34    17   109
   CHE    79     0   430   128    13   371    52    35   235
   DEA    66   341     0   136    10   438    63    51   190
   FRA    54    96   103     0    11   136    46    29    84
   GBR    12    11     9    11     0    13     7     5    14
   ITA    71   321   357   108    11     0    67    51   158
   NLD    26    48    53    37     7    48     0    22    48
   SVN    15    34    47    27     4    49    19     0    18
   USA   102   208   156    57    13   111    36    15     0
 --------------------------------------------------------------------------
BSW
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
       CAN   CHE   DEA   FRA   GBR   ITA   NLD   SVN   USA
 --------------------------------------------------------------------------
   CAN     0    94    82    61    13    86    26    17   109
   CHE    79     0   430   128    13   371    50    35   235
   DEA    66   341     0   136    10   438    57    51   190
   FRA    54    96   103     0    11   136    42    29    84
   GBR    12    11     9    11     0    13     7     5    14
   ITA    71   321   357   108    11     0    60    51   158
   NLD    21    47    51    34     7    46     0    22    33
   SVN    15    34    47    27     4    49    19     0    18
   USA   102   208   156    57    13   111    25    15     0
 --------------------------------------------------------------------------
```

```
BSW
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
      CAN   CHE   DEA   FRA   ITA   NLD   SVN
-------------------------------------------------------------------------------
  CAN     0    85    79    58    78    26    17
  CHE    73     0   428   126   361    50    35
  DEA    65   339     0   135   431    57    51
  FRA    52    95   102     0   132    42    29
  ITA    67   311   352   108     0    59    51
  NLD    21    47    51    34    46     0    22
  SVN    15    34    47    27    49    19     0
-------------------------------------------------------------------------------
BSW
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
      CAN   CHE   DEA   FRA   GBR   ITA   NLD   SVN   USA
-------------------------------------------------------------------------------
  CAN     0    94    48    61    13    85    26    10   109
  CHE    79     0   232   128    13   366    51    22   235
  DEA    39   172     0    83     7   199    44    30    91
  FRA    54    96    57     0    11   135    42    17    84
  GBR    12    11     7    11     0    12     7     4    14
  ITA    71   318   168   108    11     0    58    33   155
  NLD    21    48    40    34     7    47     0    14    33
  SVN     9    20    28    17     3    30    12     0    10
  USA   102   208    64    57    13   111    26     9     0
-------------------------------------------------------------------------------
BSW
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
      CAN   CHE   DEA   FRA   GBR   ITA   NLD   SVN   USA
-------------------------------------------------------------------------------
  CAN     0    94    82    61    13    86    27    17   109
  CHE    79     0   430   128    13   371    51    35   235
  DEA    66   341     0   136    10   438    58    51   190
  FRA    54    96   103     0    11   136    42    29    84
  GBR    12    11     9    11     0    13     7     5    14
  ITA    71   321   357   108    11     0    61    51   158
  NLD    22    48    52    34     7    47     0    22    34
  SVN    15    34    47    27     4    49    19     0    18
  USA   102   208   156    57    13   111    27    15     0
-------------------------------------------------------------------------------
BSW
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
      CAN   CHE   DEA   FRA   ITA   NLD   SVN   USA
-------------------------------------------------------------------------------
  CAN     0    94    82    61    86    27    17   109
  CHE    79     0   430   128   371    51    35   235
  DEA    66   341     0   136   438    58    51   190
  FRA    54    96   103     0   136    42    29    84
  ITA    71   321   357   108     0    61    51   158
  NLD    22    48    52    34    47     0    22    34
  SVN    15    34    47    27    49    19     0    18
  USA   102   208   156    57   111    27    15     0
-------------------------------------------------------------------------------
```

```
BSW
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
      CAN  CHE  DEA  FRA  GBR  ITA  NLD  SVN  USA
--------------------------------------------------------------------------------
  CAN    0   94   82   61   13   86   34   10  109
  CHE   79    0  430  128   13  371   52   22  235
  DEA   66  341    0  136   10  438   63   32  190
  FRA   54   96  103    0   11  136   46   17   84
  GBR   12   11    9   11    0   13    7    4   14
  ITA   71  321  357  108   11    0   67   33  158
  NLD   26   48   53   37    7   48    0   14   48
  SVN    9   20   30   17    3   30   12    0   10
  USA  102  208  156   57   13  111   36    9    0
--------------------------------------------------------------------------------
BSW
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
      CAN  CHE  DEA  FRA  GBR  ITA  NLD  SVN  USA
--------------------------------------------------------------------------------
  CAN    0   94   82   61   13   86   34   17  107
  CHE   79    0  430  128   13  371   52   35  235
  DEA   66  341    0  136   10  438   63   51  190
  FRA   54   96  103    0   11  136   46   29   84
  GBR   12   11    9   11    0   13    7    5   14
  ITA   71  321  357  108   11    0   67   51  158
  NLD   26   48   53   37    7   48    0   22   48
  SVN   15   34   47   27    4   49   19    0   18
  USA  101  208  156   57   13  111   36   15    0
--------------------------------------------------------------------------------
BSW
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
      CAN  CHE  DEA  FRA  GBR  NLD  SVN  USA
--------------------------------------------------------------------------------
  CAN    0   94   71   61   13   34   16  109
  CHE   79    0  394  127   13   51   34  233
  DEA   58  309    0  126    9   57   49  165
  FRA   54   95   94    0   11   46   28   84
  GBR   12   11    9   11    0    7    5   14
  NLD   26   47   51   37    7    0   22   48
  SVN   14   33   46   26    4   19    0   16
  USA  102  208  128   57   13   36   14    0
--------------------------------------------------------------------------------
BSW
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
      CAN  CHE  DEA  FRA  GBR  ITA  NLD  SVN  USA
--------------------------------------------------------------------------------
  CAN    0   94   82   61   13   86   34   16  109
  CHE   79    0  430  128   13  371   52   34  235
  DEA   66  341    0  136   10  438   63   50  190
  FRA   54   96  103    0   11  136   46   28   84
  GBR   12   11    9   11    0   13    7    5   14
  ITA   71  321  357  108   11    0   67   50  158
  NLD   26   48   53   37    7   48    0   22   48
  SVN   14   33   46   26    4   48   19    0   17
  USA  102  208  156   57   13  111   36   14    0
--------------------------------------------------------------------------------
```

```
BSW
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
      CAN  CHE  DEA  FRA  ITA  NLD  SVN
------------------------------------------------------------------------------
  CAN    0   85   46   58   78   22   16
  CHE   73    0  230  126  355   47   34
  DEA   38  170    0   82  198   44   41
  FRA   52   95   56    0  132   39   28
  ITA   67  307  167  108    0   54   50
  NLD   18   46   40   32   45    0   21
  SVN   14   33   37   26   48   19    0
------------------------------------------------------------------------------
BSW
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
      CAN  CHE  DEA  FRA  GBR  ITA  NLD  SVN  USA
------------------------------------------------------------------------------
  CAN    0   86   48   51   13   85   34   10  109
  CHE   73    0  228   90   12  319   46   22  205
  DEA   39  168    0   73    7  199   44   30   91
  FRA   48   69   55    0   11  102   36   17   68
  GBR   12   11    7   11    0   12    7    4   14
  ITA   71  270  168   86   11    0   64   33  155
  NLD   26   45   40   32    7   48    0   14   48
  SVN    9   20   28   17    3   30   12    0   10
  USA  102  179   64   49   13  111   36    9    0
------------------------------------------------------------------------------
BSW
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
      CAN  CHE  DEA  FRA  GBR  ITA  NLD  SVN  USA
------------------------------------------------------------------------------
  CAN    0   86   82   51   13   86   34   10  108
  CHE   73    0  379   91   12  321   47   22  205
  DEA   65  295    0  105   10  432   63   32  188
  FRA   48   69   81    0   11  103   36   17   68
  GBR   12   11    9   11    0   13    7    4   14
  ITA   71  272  354   86   11    0   67   33  158
  NLD   26   45   53   32    7   48    0   14   48
  SVN    9   20   30   17    3   30   12    0   10
  USA  101  179  152   49   13  111   36    9    0
------------------------------------------------------------------------------
BSW
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
      CAN  CHE  DEA  FRA  GBR  ITA  NLD  SVN  USA
------------------------------------------------------------------------------
  CAN    0   86   82   51   13   84   34   10  109
  CHE   73    0  379   91   12  318   47   22  205
  DEA   65  295    0  105   10  428   63   32  188
  FRA   48   69   81    0   11  101   36   17   68
  GBR   12   11    9   11    0   12    7    4   14
  ITA   71  271  351   86   11    0   64   33  154
  NLD   26   45   53   32    7   48    0   14   48
  SVN    9   20   30   17    3   30   12    0   10
  USA  102  179  152   49   13  108   36    9    0
------------------------------------------------------------------------------
```

```
--------
GUE
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
       AUS   CAN   GBR   USA
--------------------------------------------------------------------------------
  AUS    0    22    12    26
  CAN   20     0    20    54
  GBR    9    17     0    60
  USA   21    43    60     0
--------------------------------------------------------------------------------
GUE
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
       AUS   CAN   GBR   USA
--------------------------------------------------------------------------------
  AUS    0    22    12    26
  CAN   20     0    20    54
  GBR    9    17     0    60
  USA   21    43    60     0
--------------------------------------------------------------------------------
GUE
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
       AUS   CAN   GBR   USA
--------------------------------------------------------------------------------
  AUS    0    22    12    26
  CAN   20     0    20    54
  GBR    9    17     0    60
  USA   21    43    60     0
--------------------------------------------------------------------------------
GUE
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
       AUS   CAN   GBR   USA
--------------------------------------------------------------------------------
  AUS    0    22    12    26
  CAN   20     0    20    54
  GBR    9    17     0    60
  USA   21    43    60     0
--------------------------------------------------------------------------------
GUE
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
       AUS   CAN   GBR   USA
--------------------------------------------------------------------------------
  AUS    0    22    12    26
  CAN   20     0    20    54
  GBR    9    17     0    60
  USA   21    43    60     0
--------------------------------------------------------------------------------
GUE
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
       AUS   CAN   GBR   USA
--------------------------------------------------------------------------------
  AUS    0    22    12    26
  CAN   20     0    20    54
  GBR    9    17     0    60
  USA   21    43    60     0
--------------------------------------------------------------------------------
```

```
GUE
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
       AUS   CAN   GBR   USA
 -----------------------------------------------------------------------------
   AUS     0    22    12    26
   CAN    20     0    20    54
   GBR     9    17     0    60
   USA    21    43    60     0
 -----------------------------------------------------------------------------
GUE
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
       AUS   CAN   USA
 -----------------------------------------------------------------------------
   AUS     0     8     8
   CAN     6     0    26
   USA     7    24     0
 -----------------------------------------------------------------------------
GUE
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
       AUS   CAN   GBR   USA
 -----------------------------------------------------------------------------
   AUS     0    22    12    26
   CAN    20     0    20    54
   GBR     9    17     0    60
   USA    21    43    60     0
 -----------------------------------------------------------------------------
GUE
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
       AUS   CAN   GBR   USA
 -----------------------------------------------------------------------------
   AUS     0    22    12    26
   CAN    20     0    20    54
   GBR     9    17     0    60
   USA    21    43    60     0
 -----------------------------------------------------------------------------
GUE
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
       AUS   CAN   GBR   USA
 -----------------------------------------------------------------------------
   AUS     0    22    12    26
   CAN    20     0    20    54
   GBR     9    17     0    60
   USA    21    43    60     0
 -----------------------------------------------------------------------------
GUE
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
       AUS   CAN   GBR   USA
 -----------------------------------------------------------------------------
   AUS     0    22    12    26
   CAN    20     0    20    54
   GBR     9    17     0    60
   USA    21    43    60     0
 -----------------------------------------------------------------------------
```

```
GUE
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
       AUS   CAN   GBR   USA
------------------------------------------------------------------------------
  AUS     0    21    12    26
  CAN    19     0    20    52
  GBR     9    17     0    60
  USA    21    42    60     0
------------------------------------------------------------------------------
GUE
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
       AUS   CAN   GBR   USA
------------------------------------------------------------------------------
  AUS     0    22    12    26
  CAN    20     0    20    54
  GBR     9    17     0    60
  USA    21    43    60     0
------------------------------------------------------------------------------
GUE
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
       AUS   CAN   GBR   USA
------------------------------------------------------------------------------
  AUS     0    22    12    26
  CAN    20     0    20    54
  GBR     9    17     0    60
  USA    21    43    60     0
------------------------------------------------------------------------------
GUE
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
       AUS   CAN
------------------------------------------------------------------------------
  AUS     0     7
  CAN     6     0
------------------------------------------------------------------------------
GUE
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
       AUS   CAN   GBR   USA
------------------------------------------------------------------------------
  AUS     0    22    10    26
  CAN    20     0    12    54
  GBR     7     9     0    33
  USA    21    43    31     0
------------------------------------------------------------------------------
GUE
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
       AUS   CAN   GBR   USA
------------------------------------------------------------------------------
  AUS     0    21    12    26
  CAN    19     0    18    52
  GBR     9    15     0    58
  USA    21    42    58     0
------------------------------------------------------------------------------
```

```
GUE
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
       AUS  CAN  GBR  USA
 -------------------------------------------------------------------------------
   AUS    0   22   12   26
   CAN   20    0   18   54
   GBR    9   15    0   58
   USA   21   43   58    0
 -------------------------------------------------------------------------------
--------
HOL
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
       AUS  BEL  CAN  CHE  CZE  DEU  DFS  ESP  EST  FRA  FRR  GBR  HUN  IRL  ITA  JPN  KOR  NLD
NZL  POL  PRT  SVN  USA  ZAF
 -------------------------------------------------------------------------------
   AUS    0  310  643  299  415  654  591  438   47  626    8  660  350  320  623  422  205  689
427  382  416   72  814  250
   BEL  222    0  367  315  336  529  420  353   35  476   35  449  256  267  469  261  140  655
203  319  374   83  461  176
   CAN  492  324    0  537  767 1458  854  909   77  963   12 1073  603  334 1221  909  431  903
305  692  683   94 2115  318
   CHE  219  290  379    0  338  660  389  361   29  377   32  442  264  250  487  267  144  557
185  310  328   66  590  164
   CZE  204  231  454  222    0 1287  876  628   75  919   26  794  643  318 1020  584  326 1036
278  760  585  119 1176  255
   DEU  245  375  384  391  696    0 1648 1013  116 1669  109 1327  761  463 1957  963  349 1905
386 1117  803  143 2194  325
   DFS  303  337  491  315  452  566    0  708   83 1195   25 1070  572  450 1199  645  309 1305
400  814  709  124 1348  332
   ESP  276  315  458  276  405  429  442    0   65  790   13  787  502  327  964  627  301  768
261  587  642   98 1092  308
   EST   15   25   28   12   35   48   37   27    0   79    0   78   60   40   95   58   32  114
26   93   64   21  116   31
   FRA  291  415  448  306  474  467  403  467   22    0   16 1146  607  437 1413  899  322 1448
429  928  665   93 1906  307
   FRR    6   31    8   24   22   83   25    8    0   12    0   20    4    9   30    3    1   85
5   67   19   13   21    5
   GBR  451  409  980  415  504  551  641  607   31  539   16    0  588  578 1248  698  337 1265
412  750  733  119 1510  342
   HUN  206  209  490  204  539  415  380  376   33  326    4  455    0  269  721  448  283  614
228  501  477   77  835  251
   IRL  266  256  308  248  239  306  347  310   19  323    9  628  228    0  439  257  146  535
284  303  345   63  440  205
   ITA  351  391  723  401  638  836  724  645   40  525   28  868  540  385    0  885  419 1342
404  944  831  138 2020  350
   JPN  169  138  244  131  147  169  206  192   13  170    3  227  173  137  234    0  330  715
265  519  458   74 1399  258
   KOR  121   78  366   92  224  146  179  197   13  138    0  238  226   94  326  131    0  307
127  300  317   53  564  182
   NLD  469  675  670  513  794  867  838  602   64  609   52  946  437  481  922  211  178    0
522  912  814  136 1734  335
   NZL  299  145  245  149  169  193  231  203   11  186    5  303  173  231  276  105   81  446
0  249  288   39  476  188
   POL  185  235  399  212  469  485  454  342   45  361   61  466  356  213  584  143  199  591
136    0  603  112 1049  232
   PRT  269  358  675  291  498  551  594  656   42  564   18  679  453  313  784  189  260  815
210  546    0   95  910  303
   SVN   45   69   69   49   90  115  102   71   16   63   12   94   59   49  119   37   30  114
30   90   79    0  120   50
   USA  548  353 1761  484  771  611  677  618   66  740   13 1177  699  398 1088  293  610 1209
382  690  883   97    0  404
   ZAF  211  150  293  151  190  222  255  285   15  212    4  316  218  196  299  155  144  298
166  164  288   37  426    0
 -------------------------------------------------------------------------------
```

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

	AUS	BEL	CAN	CHE	CZE	DEU	DFS	ESP	EST	FRA	FRR	GBR	HUN	IRL	ITA	JPN	KOR	NLD	NZL	POL	PRT	SVN	USA	ZAF
AUS	0	304	643	299	415	654	590	452	47	496	8	660	350	320	623	422	201	636	427	380	416	72	814	203
BEL	222	0	362	313	335	524	415	359	35	430	33	443	254	266	465	255	139	607	200	316	371	83	447	157
CAN	492	324	0	537	767	1457	854	917	77	791	10	1073	603	334	1221	909	427	828	305	691	683	94	2115	267
CHE	219	289	379	0	338	660	389	367	29	342	28	442	264	250	487	267	143	536	185	309	328	66	590	145
CZE	204	231	454	222	0	1287	876	642	75	870	25	794	643	318	1020	584	324	1019	278	760	585	119	1176	235
DEU	245	375	384	391	696	0	1648	1045	116	1524	93	1326	761	463	1957	963	344	1814	386	1114	803	143	2194	280
DFS	303	337	491	315	452	566	0	732	83	1019	23	1068	571	448	1198	645	306	1227	399	810	708	124	1347	279
ESP	285	331	464	284	424	476	468	0	68	719	11	811	511	342	995	637	302	761	273	605	675	102	1116	265
EST	15	25	28	12	35	48	37	29	0	74	0	78	60	40	95	58	32	111	26	93	64	21	116	30
FRA	253	391	390	278	443	383	378	468	22	0	13	991	555	381	1279	734	282	1137	337	862	593	92	1467	223
FRR	6	30	8	24	21	72	23	8	0	12	0	17	4	9	28	3	1	69	3	62	18	12	19	5
GBR	451	409	980	415	504	551	641	640	31	489	14	0	588	576	1248	698	335	1201	412	748	732	119	1509	285
HUN	206	209	490	204	539	415	380	385	33	311	4	455	0	269	721	448	281	593	228	500	477	77	835	225
IRL	266	256	308	248	239	306	347	330	19	296	9	627	228	0	439	257	144	522	284	303	345	63	438	168
ITA	351	391	723	401	638	836	724	698	40	471	26	868	540	385	0	885	414	1287	404	944	831	138	2020	305
JPN	169	138	244	131	147	169	206	196	13	165	3	227	173	137	234	0	329	646	265	518	458	74	1399	215
KOR	121	78	364	92	223	145	179	198	13	131	0	238	225	94	325	131	0	287	126	298	315	53	557	163
NLD	441	626	613	493	777	828	814	607	63	496	47	893	420	467	881	209	169	0	495	889	783	136	1496	272
NZL	299	145	245	149	169	193	231	212	11	157	3	303	173	231	276	105	81	425	0	249	288	39	476	152
POL	185	235	399	212	469	485	454	362	45	346	60	465	356	213	584	143	198	580	136	0	602	112	1047	207
PRT	269	358	675	291	498	551	594	710	42	531	17	679	453	313	784	189	259	783	210	546	0	95	910	266
SVN	45	69	69	49	90	115	102	77	16	63	11	94	59	49	119	37	30	112	30	90	79	0	120	50
USA	548	353	1761	484	771	611	676	638	66	540	13	1177	699	398	1088	293	602	967	382	690	883	97	0	337
ZAF	180	139	253	137	178	198	231	249	15	173	4	268	203	167	269	149	130	240	132	157	262	37	344	0

```
HOL
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
      AUS  BEL  CAN  CHE  CZE  DEU  DFS  ESP  EST  FRA  FRR  GBR  HUN  IRL  ITA  JPN  KOR  NLD
NZL  POL  PRT  SVN  USA  ZAF
 --------------------------------------------------------------------------
  AUS    0  309  635  298  414  652  586  432   47  618    8  654  350  318  622  421  202  664
421  380  413   47  806  250
  BEL  222    0  367  315  336  529  419  355   35  476   35  449  256  267  469  261  139  633
203  319  374   54  461  176
  CAN  491  324    0  537  767 1458  854  910   77  963   12 1073  603  334 1221  909  428  872
305  692  683   69 2115  318
  CHE  219  290  379    0  338  660  389  362   29  377   32  442  264  250  487  267  143  549
185  310  328   45  590  164
  CZE  204  231  454  222    0 1287  876  629   75  919   26  794  643  318 1020  584  325 1032
278  760  585   91 1176  255
  DEU  245  375  384  391  696    0 1648 1017  116 1669  109 1327  761  463 1957  963  345 1864
386 1117  803  109 2194  325
  DFS  303  337  491  315  452  566    0  710   83 1194   25 1069  571  449 1198  645  306 1264
399  813  708   92 1347  332
  ESP  277  317  458  277  406  432  444    0   65  792   13  790  503  328  968  629  299  757
261  589  645   71 1094  308
  EST   15   25   28   12   35   48   37   27    0   79    0   78   60   40   95   58   32  113
26   93   64   17  116   31
  FRA  291  415  448  306  474  467  403  470   22    0   16 1146  607  437 1413  899  318 1335
429  928  665   69 1906  307
  FRR    6   31    8   24   22   83   25    8    0   12    0   20    4    9   30    3    1   82
5   67   19    8   21    5
  GBR  450  409  980  415  504  551  641  610   31  539   16    0  588  577 1248  698  335 1239
412  750  733   86 1510  342
  HUN  206  209  490  204  539  415  380  377   33  326    4  455    0  269  721  448  282  605
228  501  477   60  835  251
  IRL  266  256  308  248  239  306  347  311   19  323    9  627  228    0  439  257  145  529
284  303  345   42  439  205
  ITA  351  391  723  401  638  836  724  649   40  525   28  868  540  385    0  885  416 1320
404  944  831  104 2020  350
  JPN  169  138  244  131  147  169  206  193   13  170    3  227  173  137  234    0  329  682
265  519  458   51 1399  258
  KOR  121   78  365   92  224  146  179  197   13  138    0  238  226   94  326  131    0  299
126  299  316   40  558  181
  NLD  466  651  663  512  794  859  837  603   64  586   52  935  437  478  921  211  176    0
509  903  804   97 1607  325
  NZL  298  145  245  149  169  193  231  204   11  186    5  303  173  231  276  105   81  444
0  249  288   29  476  188
  POL  185  235  399  212  469  485  454  344   45  361   61  466  356  213  584  143  199  590
136    0  603   87 1049  232
  PRT  269  358  675  291  498  551  594  660   42  564   18  679  453  313  784  189  260  808
210  546    0   67  910  303
  SVN   30   46   52   36   70   89   76   50   12   47    8   68   45   36   88   22   23   81
23   70   56    0   88   32
  USA  546  353 1761  484  771  611  676  620   66  740   13 1177  699  398 1088  293  603 1172
382  690  883   74    0  404
  ZAF  211  150  293  151  190  222  255  285   15  212    4  316  218  196  299  155  143  296
166  164  288   24  426    0
 --------------------------------------------------------------------------
```

```
HOL
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
      AUS  BEL  CAN  CHE  CZE  DEU  DFS  ESP  EST  FRA  FRR  GBR  HUN  IRL  ITA  JPN  KOR  NLD
POL  PRT  SVN  USA  ZAF
 ----------------------------------------------------------------------------
  AUS    0  298  643  289  413  653  589  449   45  496    8  657  349  318  623  422  201  289
378  416   46  812  249
  BEL  222    0  356  294  326  515  408  351   35  427   33  434  247  261  458  250  134  325
310  365   53  437  170
  CAN  492  322    0  503  766 1456  850  915   76  791   12 1071  603  333 1220  909  427  446
691  683   69 2115  317
  CHE  219  274  352    0  322  567  384  360   28  340   20  434  258  249  464  266  141  303
291  319   45  545  164
  CZE  204  230  454  214    0 1283  870  635   71  870   26  788  641  315 1017  584  324  612
754  583   90 1171  252
  DEU  245  373  384  334  696    0 1636 1035  115 1523  109 1324  758  462 1956  962  344  891
1112  802  108 2191  324
  DFS  303  336  491  310  452  566    0  723   81 1015   25 1058  567  447 1192  642  306  605
801  706   91 1338  331
  ESP  282  325  462  281  419  462  459    0   66  713   13  804  508  338  986  635  302  400
597  667   70 1110  313
  EST   15   25   28   12   34   48   37   28    0   72    0   75   60   38   93   58   32   73
92   63   16  115   30
  FRA  253  391  390  276  443  383  378  455   22    0   14  990  554  380 1279  734  282  551
861  593   69 1466  254
  FRR    6   30    8   16   22   83   25    8    0   12    0   20    4    9   30    3    1   39
67   19    8   21    5
  GBR  451  406  980  410  502  550  641  633   31  489   16    0  584  569 1245  697  335  561
741  730   85 1502  339
  HUN  206  208  490  200  539  415  380  383   33  311    4  454    0  266  719  448  281  309
499  475   60  833  251
  IRL  266  256  308  247  239  305  347  325   19  296    9  621  228    0  437  256  144  253
300  344   42  435  203
  ITA  351  391  723  385  638  835  724  682   40  471   28  866  539  385    0  885  414  661
941  831  103 2017  348
  JPN  169  138  244  131  147  169  206  196   13  165    3  227  173  137  234    0  329  275
518  458   51 1399  258
  KOR  121   78  364   91  223  145  179  198   13  131    0  238  225   94  325  131    0  151
298  315   40  556  181
  NLD  225  322  373  263  547  451  504  314   45  309   29  470  225  252  511  138   96    0
540  398   88  638  160
  POL  185  234  399  194  467  485  452  355   45  346   61  463  356  212  584  143  198  411
0  601   86 1046  230
  PRT  269  357  675  284  498  551  594  694   42  531   18  679  453  313  784  189  259  389
546    0   66  909  302
  SVN   30   46   52   36   69   89   76   51   12   47    8   68   45   36   88   22   23   80
70   56    0   88   32
  USA  548  349 1761  442  770  611  676  634   66  540   13 1176  698  398 1087  293  601  454
689  883   74    0  402
  ZAF  211  150  293  151  190  222  255  290   15  182    4  316  218  196  299  155  143  139
164  288   24  425    0
 ----------------------------------------------------------------------------
```

```
HOL
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
       AUS  BEL  CAN  CHE  CZE  DEU  DFS  ESP  EST  FRA  FRR  GBR  HUN  IRL  ITA  JPN  KOR  NLD
NZL  POL  PRT  SVN  USA  ZAF
 ----------------------------------------------------------------------------
  AUS    0  310  643  299  415  654  591  438   47  626    8  660  350  320  623  422  205  689
427  382  416   72  814  250
  BEL  222    0  367  315  336  529  420  352   35  476   35  449  256  267  469  261  140  655
203  319  374   83  461  176
  CAN  492  324    0  537  767 1458  854  908   77  963   12 1073  603  334 1221  909  431  903
305  692  683   94 2115  318
  CHE  219  290  379    0  338  660  389  360   29  377   32  442  264  250  487  267  144  557
185  310  328   66  590  164
  CZE  204  231  454  222    0 1287  876  627   75  919   26  794  643  318 1020  584  326 1036
278  760  585  119 1176  255
  DEU  245  375  384  391  696    0 1648 1011  116 1669  109 1327  761  463 1957  963  349 1905
386 1117  803  143 2194  325
  DFS  302  336  491  315  450  566    0  706   83 1195   25 1070  572  450 1199  645  309 1305
400  814  709  124 1348  332
  ESP  276  315  457  276  404  428  439    0   65  788   13  784  501  326  961  626  300  767
261  587  641   98 1090  308
  EST   15   25   28   12   35   48   37   27    0   79    0   78   60   40   95   58   32  114
26   93   64   21  116   31
  FRA  291  415  448  306  474  467  400  465   22    0   16 1146  607  437 1413  899  322 1448
429  928  665   93 1906  307
  FRR    6   31    8   24   22   83   25    8    0   12    0   20    4    9   30    3    1   85
5   67   19   13   21    5
  GBR  451  409  980  415  504  551  639  605   31  539   16    0  588  578 1248  698  337 1265
412  750  733  119 1510  342
  HUN  206  209  490  204  539  415  378  376   33  326    4  455    0  269  721  448  283  614
228  501  477   77  835  251
  IRL  266  256  308  248  239  306  346  310   19  323    9  628  228    0  439  257  146  535
284  303  345   63  440  205
  ITA  351  391  723  401  638  836  723  643   40  525   28  868  540  385    0  885  419 1342
404  944  831  138 2020  350
  JPN  169  138  244  131  147  169  206  192   13  170    3  227  173  137  234    0  330  715
265  519  458   74 1399  258
  KOR  121   78  366   92  224  146  179  196   13  138    0  238  226   94  326  131    0  307
127  300  317   53  564  182
  NLD  469  675  670  513  794  867  838  601   64  609   52  946  437  481  922  211  178    0
522  912  814  136 1734  335
  NZL  299  145  245  149  169  193  231  203   11  186    5  303  173  231  276  105   81  446
0  249  288   39  476  188
  POL  185  235  399  212  469  485  454  342   45  361   61  466  356  213  584  143  199  591
136    0  603  112 1049  232
  PRT  269  358  675  291  498  551  592  655   42  564   18  679  453  313  784  189  260  815
210  546    0   95  910  303
  SVN   45   69   69   49   90  115  102   71   16   63   12   94   59   49  119   37   30  114
30   90   79    0  120   50
  USA  548  353 1761  484  771  611  676  617   66  740   13 1177  699  398 1088  293  610 1209
382  690  883   97    0  404
  ZAF  211  150  293  151  190  222  255  285   15  212    4  316  218  196  299  155  144  298
166  164  288   37  426    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  CZE  DEU  DFS  ESP  EST  FRA  FRR  GBR  HUN  IRL  ITA  JPN  KOR  NLD
NZL  POL  PRT  SVN  USA  ZAF
 --------------------------------------------------------------------------
  AUS    0  285  643  299  415  654  591  438   47  626    8  660  350  320  623  232  202  687
427  382  416   47  814  250
  BEL  221    0  350  308  321  506  399  336   35  438   33  427  241  258  450  169  130  575
188  306  355   54  420  164
  CAN  492  319    0  537  767 1458  854  908   77  963   12 1073  603  334 1221  607  427  900
305  692  683   69 2115  318
  CHE  219  288  379    0  338  660  389  361   29  377   32  442  264  250  487  196  142  555
185  310  328   45  590  164
  CZE  204  230  454  222    0 1287  876  627   75  919   26  794  643  318 1020  443  324 1036
278  760  585   91 1176  255
  DEU  245  372  384  391  696    0 1648 1012  116 1669  109 1327  761  463 1957  685  344 1900
386 1117  803  109 2194  325
  DFS  303  335  491  315  452  566    0  706   83 1195   25 1070  572  450 1199  417  305 1297
400  814  709   92 1348  332
  ESP  276  314  457  276  404  429  441    0   65  788   13  785  501  326  962  447  297  765
261  587  642   71 1090  308
  EST   15   25   28   12   35   48   37   27    0   79    0   78   60   40   95   46   32  113
 26   93   64   17  116   31
  FRA  291  410  448  306  474  467  403  465   22    0   16 1146  607  437 1413  566  318 1436
429  928  665   69 1906  307
  FRR    6   31    8   24   22   83   25    8    0   12    0   20    4    9   30    2    1   85
  5   67   19    8   21    5
  GBR  451  404  980  415  504  551  641  606   31  539   16    0  588  578 1248  458  334 1263
412  750  733   86 1510  342
  HUN  206  207  490  204  539  415  380  376   33  326    4  455    0  269  721  330  281  614
228  501  477   60  835  251
  IRL  266  254  308  248  239  306  347  310   19  323    9  628  228    0  439  173  144  534
284  303  345   42  440  205
  ITA  351  389  723  401  638  836  724  644   40  525   28  868  540  385    0  646  415 1341
404  944  831  104 2020  350
  JPN  133  110  201  112  129  141  174  149   13  141    2  181  142  113  199    0  243  470
151  417  302   48  880  160
  KOR  121   78  366   92  224  146  179  196   13  138    0  238  226   94  326  114    0  301
125  298  315   40  557  180
  NLD  469  595  670  513  794  866  838  601   64  609   52  945  437  481  922  169  178    0
521  911  813   97 1727  335
  NZL  299  142  245  149  169  193  231  203   11  186    5  303  173  231  276   80   81  446
  0  249  288   29  476  188
  POL  185  234  399  212  469  485  454  342   45  361   61  466  356  213  584  132  199  591
136    0  603   87 1049  232
  PRT  269  352  675  291  498  551  594  656   42  564   18  679  453  313  784  150  260  814
210  546    0   67  910  303
  SVN   30   46   52   36   70   89   76   50   12   47    8   68   45   36   88   22   23   81
 23   70   56    0   88   32
  USA  548  344 1761  484  771  611  676  617   66  740   13 1177  699  398 1088  236  604 1206
382  690  883   74    0  404
  ZAF  211  148  293  151  190  222  255  285   15  212    4  316  218  196  299  110  144  298
166  164  288   24  426    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  CZE  DEU  DFS  ESP  EST  FRA  FRR  GBR  HUN  IRL  ITA  JPN  KOR  NLD
NZL  POL  PRT  SVN  USA  ZAF
 --------------------------------------------------------------------------
  AUS    0  310  643  299  415  654  591  447   47  626    8  660  350  320  623  422  201  689
427  382  416   72  814  250
  BEL  222    0  367  315  336  529  420  358   35  476   35  449  256  267  469  261  139  655
203  319  374   83  461  176
  CAN  492  324    0  537  767 1458  854  914   77  963   12 1073  603  334 1221  909  427  903
305  692  683   94 2115  318
  CHE  219  290  379    0  338  660  389  365   29  377   32  442  264  250  487  267  143  557
185  310  328   66  590  164
  CZE  204  231  454  222    0 1287  876  636   75  919   26  794  643  318 1020  584  324 1036
278  760  585  119 1176  255
  DEU  245  375  384  391  696    0 1648 1030  116 1669  109 1327  761  463 1957  963  344 1905
386 1117  803  143 2194  325
  DFS  303  337  491  315  452  566    0  721   83 1195   25 1070  572  450 1199  645  306 1305
400  814  709  124 1348  332
  ESP  280  322  460  281  413  451  454    0   66  805   13  803  507  336  982  633  301  786
270  597  659   99 1107  312
  EST   15   25   28   12   35   48   37   27    0   79    0   78   60   40   95   58   32  114
26   93   64   21  116   31
  FRA  291  415  448  306  474  467  403  488   22    0   16 1146  607  437 1413  899  317 1448
429  928  665   93 1906  307
  FRR    6   31    8   24   22   83   25    8    0   12    0   20    4    9   30    3    1   85
5   67   19   13   21    5
  GBR  451  409  980  415  504  551  641  625   31  539   16    0  588  578 1248  698  335 1265
412  750  733  119 1510  342
  HUN  206  209  490  204  539  415  380  380   33  326    4  455    0  269  721  448  281  614
228  501  477   77  835  251
  IRL  266  256  308  248  239  306  347  320   19  323    9  628  228    0  439  257  144  535
284  303  345   63  440  205
  ITA  351  391  723  401  638  836  724  671   40  525   28  868  540  385    0  885  414 1342
404  944  831  138 2020  350
  JPN  169  138  244  131  147  169  206  195   13  170    3  227  173  137  234    0  329  715
265  519  458   74 1399  258
  KOR  121   78  364   92  223  145  179  197   13  137    0  238  225   94  324  131    0  302
126  298  314   53  556  181
  NLD  469  675  670  513  794  867  838  621   64  609   52  946  437  481  922  211  177    0
522  912  814  136 1734  335
  NZL  299  145  245  149  169  193  231  208   11  186    5  303  173  231  276  105   81  446
0  249  288   39  476  188
  POL  185  235  399  212  469  485  454  349   45  361   61  466  356  213  584  143  198  591
136    0  603  112 1049  232
  PRT  269  358  675  291  498  551  594  682   42  564   18  679  453  313  784  189  259  815
210  546    0   95  910  303
  SVN   45   69   69   49   90  115  102   73   16   63   12   94   59   49  119   37   30  114
30   90   79    0  120   50
  USA  548  353 1761  484  771  611  677  630   66  740   13 1177  699  398 1088  293  601 1209
382  690  883   97    0  404
  ZAF  211  150  293  151  190  222  255  289   15  212    4  316  218  196  299  155  143  298
166  164  288   37  426    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  CZE  DEU  DFS  ESP  EST  FRA  FRR  GBR  HUN  IRL  ITA  JPN  KOR  NLD
POL  PRT  SVN  USA  ZAF
  -------------------------------------------------------------------------
  AUS    0  248  460  261  269  508  448  354   40  331    8  516  283  270  477  299  114  485
291  340   68  540  182
  BEL  211    0  330  304  259  486  383  331   34  350   31  409  237  244  434  224   91  537
281  343   80  399  145
  CAN  381  314    0  504  633 1377  760  845   72  639   10  978  582  306 1167  785  325  763
640  642   91 1921  256
  CHE  208  284  364    0  268  660  388  366   29  297   29  442  264  242  487  260  100  527
286  321   64  590  145
  CZE  152  186  376  173    0 1056  690  532   67  686   25  640  527  241  863  474  254  868
658  475  110  968  193
  DEU  229  359  380  391  567    0 1647 1035  116 1251   97 1325  760  445 1957  927  265 1770
1065  794  140 2194  280
  DFS  289  329  488  315  372  566    0  718   83  798   24 1064  569  424 1194  601  221 1189
761  696  123 1346  279
  ESP  260  318  450  284  319  468  462    0   68  592   12  799  509  323  987  598  222  732
566  659  102 1106  265
  EST   15   25   28   12   30   48   37   29    0   62    0   77   60   38   95   56   27  110
91   63   21  116   30
  FRA  193  317  318  238  327  309  315  387   18    0   10  775  472  298 1047  581  203  916
760  485   83 1120  180
  FRR    6   29    8   24   21   75   24    8    0    8    0   18    4    9   30    3    1   73
67   18   11   19    5
  GBR  398  392  907  415  392  551  639  635   31  384   15    0  587  534 1247  650  248 1150
705  721  116 1502  285
  HUN  196  203  484  204  430  415  380  384   33  266    4  455    0  258  720  433  227  577
476  474   76  834  225
  IRL  247  247  305  246  184  304  345  324   19  236    9  595  226    0  423  230   90  473
267  331   62  412  164
  ITA  320  383  714  401  531  836  723  689   40  397   28  866  540  382    0  847  326 1262
909  825  135 2018  305
  JPN  163  137  240  131  133  168  204  191   13  144    3  224  171  136  231    0  243  612
484  432   74 1270  206
  KOR   68   59  277   68  180  111  136  134   11  112    0  165  177   60  253  100    0  217
251  239   45  425  117
  NLD  379  554  593  488  683  814  809  588   63  422   49  868  423  451  873  206  123    0
838  761  133 1402  267
  POL  170  222  378  199  413  464  430  330   44  308   61  444  339  199  570  137  177  556
0  564  109  998  192
  PRT  251  343  639  285  394  541  581  687   41  460   17  666  449  306  776  184  198  764
517    0   95  899  264
  SVN   45   67   68   48   86  113  102   76   16   57   11   93   58   49  117   37   28  111
89   79    0  117   49
  USA  430  339 1648  484  619  611  676  635   66  405   13 1176  699  392 1088  288  451  936
660  866   96    0  337
  ZAF  175  136  250  137  141  198  231  249   15  137    4  268  203  166  269  148   86  238
148  260   37  344    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  CZE  DEU  DFS  ESP  EST  FRA  FRR  GBR  HUN  IRL  ITA  JPN  KOR  NLD
POL  PRT  SVN  USA  ZAF
 ---------------------------------------------------------------------------
  AUS    0  282  635  298  412  353  585  442   45  617    8  654  348  317  620  421  202  654
378  413   70  806  250
  BEL  221    0  347  307  319  355  396  341   34  435   33  426  240  257  445  239  131  568
304  355   82  418  164
  CAN  491  319    0  536  761  987  853  915   75  948   12 1073  600  334 1218  909  427  856
687  683   92 2115  318
  CHE  219  288  379    0  336  444  388  366   29  374   32  441  263  250  483  266  142  546
308  328   65  589  164
  CZE  204  228  454  221    0  879  868  636   72  912   26  788  639  317 1013  581  324 1021
753  583  117 1171  254
  DEU  171  274  289  276  497    0  948  725   86 1001   46  819  506  276 1356  602  239 1163
809  502  120 1352  184
  DFS  303  334  491  315  451  399    0  726   81 1166   25 1067  567  449 1191  645  306 1249
808  707  122 1344  332
  ESP  282  324  462  283  419  306  459    0   65  798   13  806  506  339  984  635  302  766
597  667   98 1111  313
  EST   15   24   28   12   33   34   36   28    0   78    0   77   58   39   92   57   32  111
90   64   20  115   31
  FRA  291  410  448  306  474  278  402  497   22    0   15 1131  603  431 1402  886  313 1292
919  662   92 1867  306
  FRR    6   31    8   24   22   34   25    8    0   12    0   20    4    9   30    3    1   78
66   19   13   20    5
  GBR  450  404  980  415  503  369  641  633   30  539   16    0  586  573 1246  698  335 1221
745  732  118 1508  341
  HUN  206  206  490  204  537  282  377  383   32  326    4  455    0  268  716  447  281  596
498  476   75  832  250
  IRL  266  254  308  248  239  205  347  325   19  323    9  623  228    0  437  257  144  522
301  345   62  438  205
  ITA  351  386  723  400  635  564  722  682   39  524   28  867  538  385    0  882  414 1303
935  830  136 2018  349
  JPN  169  138  244  131  147  131  206  196   13  170    3  227  173  137  234    0  329  674
516  458   72 1399  258
  KOR  121   78  364   92  224  114  179  196   13  137    0  238  225   94  324  131    0  295
298  313   53  554  181
  NLD  462  593  657  510  791  554  834  622   63  572   50  926  434  477  914  210  174    0
887  796  134 1562  323
  POL  185  233  399  211  466  382  451  355   43  361   61  464  354  213  581  143  199  582
0  600  109 1042  231
  PRT  269  352  675  291  498  389  594  694   42  564   18  679  453  313  784  189  257  803
546    0   94  910  303
  SVN   45   68   69   49   89  104  100   74   15   63   12   94   58   49  117   37   30  113
88   79    0  118   50
  USA  546  344 1761  484  771  391  676  634   66  705   13 1177  699  398 1088  293  594 1156
690  883   97    0  404
  ZAF  211  148  293  151  190  131  255  290   15  212    4  316  218  196  299  155  143  292
164  288   37  426    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  CZE  DEU  DFS  ESP  EST  FRA  FRR  GBR  HUN  IRL  ITA  JPN  KOR  NLD
NZL  POL  PRT  SVN  USA  ZAF
 --------------------------------------------------------------------------
  AUS    0  304  643  299  415  654  590  449   47  580    8  660  350  320  623  422  203  636
427  381  416   72  814  250
  BEL  222    0  363  314  335  524  416  357   35  457   35  444  254  266  466  255  139  608
200  317  372   83  448  175
  CAN  492  324    0  537  767 1457  854  915   77  884   12 1073  603  334 1221  909  429  828
305  692  683   94 2115  318
  CHE  219  289  379    0  338  660  389  366   29  368   32  442  264  250  487  267  143  536
185  310  328   66  590  164
  CZE  204  231  454  222    0 1287  876  639   75  909   26  794  643  318 1020  584  325 1019
278  760  585  119 1176  255
  DEU  245  375  384  391  696    0 1648 1037  116 1633  109 1327  761  463 1957  963  346 1815
386 1116  803  143 2194  325
  DFS  303  337  491  315  452  566    0  726   83 1117   25 1069  571  449 1198  645  307 1227
399  813  708  124 1347  332
  ESP  283  325  462  283  420  463  459    0   67  771   13  807  509  339  989  635  303  755
271  601  668  100 1111  313
  EST   15   25   28   12   35   48   37   28    0   76    0   78   60   40   95   58   32  111
 26   93   64   21  116   31
  FRA  290  413  445  306  472  464  400  498   22    0   15 1089  593  419 1371  821  302 1247
395  916  646   93 1705  292
  FRR    6   31    8   24   22   83   25    8    0   12    0   20    4    9   30    3    1   76
  5   67   19   13   21    5
  GBR  451  409  980  415  504  551  641  633   31  534   16    0  588  577 1248  698  335 1202
412  750  733  119 1510  342
  HUN  206  209  490  204  539  415  380  383   33  325    4  455    0  269  721  448  283  593
228  501  477   77  835  251
  IRL  266  256  308  248  239  306  347  326   19  321    9  627  228    0  439  257  145  522
284  303  345   63  439  205
  ITA  351  391  723  401  638  836  724  685   40  521   28  868  540  385    0  885  417 1287
404  944  831  138 2020  350
  JPN  169  138  244  131  147  169  206  196   13  170    3  227  173  137  234    0  329  646
265  519  458   74 1399  258
  KOR  121   78  365   92  224  146  179  198   13  137    0  238  226   94  326  131    0  288
126  300  316   53  560  181
  NLD  441  626  614  493  777  828  813  597   63  557   50  894  420  466  882  209  169    0
495  890  784  136 1498  316
  NZL  299  145  245  149  169  193  231  210   11  184    5  303  173  231  276  105   81  425
  0  249  288   39  476  188
  POL  185  235  399  212  469  485  454  356   45  361   61  466  356  213  584  143  199  582
136    0  603  112 1049  232
  PRT  269  358  675  291  498  551  594  696   42  561   18  679  453  313  784  189  260  783
210  546    0   95  910  303
  SVN   45   69   69   49   90  115  102   74   16   63   12   94   59   49  119   37   30  112
 30   90   79    0  120   50
  USA  548  353 1761  484  771  611  677  634   66  669   13 1177  699  398 1088  293  604  967
382  690  883   97    0  404
  ZAF  211  150  293  151  190  222  255  290   15  210    4  316  218  196  299  155  143  278
166  164  288   37  426    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 CZE  DEU  DFS  ESP EST  FRA FRR  GBR  HUN  IRL  ITA  JPN  KOR  NLD
NZL  POL PRT SVN  USA ZAF
 ----------------------------------------------------------------------------
  AUS    0  304  643  299  415  654  542  445   47  623    8  660  350  320  623  422  204  666
427  382  416   72  814  249
  BEL  222    0  363  314  335  524  409  356   35  465   35  444  254  266  466  255  139  620
200  317  372   83  448  174
  CAN  492  324    0  537  767 1458  774  913   77  948   12 1073  603  334 1221  909  430  872
305  692  683   94 2115  318
  CHE  219  289  379    0  338  660  371  364   29  374   32  442  264  250  487  267  143  549
185  310  328   66  590  163
  CZE  204  231  454  222    0 1287  843  631   75  915   26  794  643  318 1020  584  326 1032
278  760  585  119 1176  255
  DEU  245  375  384  391  696    0 1558 1025  116 1657  109 1327  761  463 1957  963  347 1864
386 1117  803  143 2194  324
  DFS  303  336  491  315  452  564    0  673   79 1084   25 1010  555  430 1154  589  294 1228
371  789  683  124 1251  303
  ESP  280  319  459  279  408  442  447    0   66  787   13  796  503  331  975  631  300  762
264  592  650   99 1100  310
  EST   15   25   28   12   35   48   37   27    0   78    0   78   60   40   95   58   32  113
 26   93   64   21  116   31
  FRA  291  415  448  306  474  465  402  477   22    0   16 1133  605  432 1403  886  316 1329
425  924  662   93 1867  305
  FRR    6   31    8   24   22   83   25    8    0   12    0   20    4    9   30    3    1   82
  5   67   19   13   21    5
  GBR  451  408  979  415  504  550  639  613   31  538   16    0  588  577 1248  698  336 1239
412  750  733  119 1510  341
  HUN  206  209  490  204  539  415  380  377   33  326    4  455    0  269  721  448  283  605
228  501  477   77  835  251
  IRL  266  256  308  248  239  306  346  314   19  323    9  627  228    0  439  257  145  529
284  303  345   63  439  204
  ITA  351  391  723  401  638  836  722  659   40  524   28  867  540  385    0  885  418 1320
404  944  831  138 2020  349
  JPN  169  138  244  131  147  169  206  194   13  170    3  227  173  137  234    0  329  682
265  519  458   74 1399  258
  KOR  121   78  366   92  224  146  179  197   13  138    0  238  226   94  326  131    0  301
126  300  316   53  562  181
  NLD  466  647  663  512  794  859  836  608   64  585   52  934  437  478  921  211  176    0
509  903  804  136 1607  324
  NZL  299  145  245  149  169  193  231  205   11  186    5  303  173  231  276  105   81  444
  0  249  288   39  476  187
  POL  185  235  399  212  469  485  454  346   45  361   61  466  356  213  584  143  199  590
136    0  603  112 1049  232
  PRT  269  358  675  291  498  551  590  669   42  564   18  679  453  313  784  189  260  808
210  546    0   95  910  303
  SVN   45   69   69   49   90  115  102   73   16   63   12   94   59   49  119   37   30  114
 30   90   79    0  120   50
  USA  548  353 1761  484  771  611  676  623   66  705   13 1177  699  398 1088  293  606 1172
382  690  883   97    0  403
  ZAF  211  150  293  151  190  222  254  287   15  212    4  316  218  196  299  155  144  296
166  164  288   37  426    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  CZE  DEU  DFS  ESP  EST  FRA  FRR  GBR  HUN  IRL  ITA  JPN  KOR  NLD
NZL  POL  PRT  SVN  USA  ZAF
 --------------------------------------------------------------------------
  AUS    0  304  643  299  415  654  591  456   47  626    8  660  350  320  623  422  200  689
427  382  416   72  814  250
  BEL  222    0  363  314  335  524  417  361   35  466   35  444  254  266  466  255  138  626
200  317  372   83  448  175
  CAN  492  324    0  537  767 1458  854  919   77  963   12 1073  603  334 1221  909  426  903
305  692  683   94 2115  318
  CHE  219  289  379    0  338  660  389  367   29  377   32  442  264  250  487  267  142  557
185  310  328   66  590  164
  CZE  204  231  454  222    0 1287  876  643   75  919   26  794  643  318 1020  584  324 1036
278  760  585  119 1176  255
  DEU  245  375  384  391  696    0 1648 1051  116 1669  109 1327  761  463 1957  963  343 1905
386 1117  803  143 2194  325
  DFS  303  337  492  315  452  566    0  736   83 1195   25 1070  572  450 1199  645  305 1305
400  814  709  124 1348  332
  ESP  287  333  464  286  426  483  472    0   68  822   13  815  513  343 1000  639  302  803
274  610  680  102 1120  314
  EST   15   25   28   12   35   48   37   30    0   79    0   78   60   40   95   58   32  114
26   93   64   21  116   31
  FRA  291  415  448  306  474  467  403  521   22    0   16 1146  607  437 1413  899  316 1448
429  928  665   93 1906  307
  FRR    6   31    8   24   22   83   25    8    0   12    0   20    4    9   30    3    1   85
5   67   19   13   21    5
  GBR  451  409  980  415  504  551  641  643   31  539   16    0  588  578 1248  698  334 1265
412  750  733  119 1510  342
  HUN  206  209  490  204  539  415  381  389   33  326    4  455    0  269  721  448  280  614
228  501  477   77  835  251
  IRL  266  256  308  248  239  306  347  332   19  323    9  628  228    0  439  257  143  535
284  303  345   63  440  205
  ITA  351  391  723  401  638  836  724  702   40  525   28  868  540  385    0  885  413 1342
404  944  831  138 2020  350
  JPN  169  138  244  131  147  169  206  196   13  170    3  227  173  137  234    0  328  715
265  519  458   74 1399  258
  KOR  120   77  363   91  223  144  178  196   13  136    0  237  224   93  323  130    0  301
125  297  313   53  554  180
  NLD  469  654  670  513  794  867  838  643   64  609   52  946  437  481  922  211  176    0
522  912  814  136 1734  335
  NZL  299  145  245  149  169  193  231  212   11  186    5  303  173  231  276  105   80  446
0  249  288   39  476  188
  POL  185  235  399  212  469  485  454  369   45  361   61  466  356  213  584  143  198  591
136    0  603  112 1049  232
  PRT  269  358  675  291  498  551  594  717   42  564   18  679  453  313  784  189  258  815
210  546    0   95  910  303
  SVN   45   69   69   49   90  115  102   78   16   63   12   94   59   49  119   37   30  114
30   90   79    0  120   50
  USA  548  353 1761  484  771  611  678  640   66  740   13 1177  699  398 1088  293  599 1209
382  690  883   97    0  404
  ZAF  211  150  293  151  190  222  256  291   15  212    4  316  218  196  299  155  142  298
166  164  288   37  426    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  CZE  DEU  DFS  ESP  EST  FRA  FRR  GBR  HUN  IRL  ITA  JPN  KOR  NLD
POL  PRT  SVN  USA  ZAF
 --------------------------------------------------------------------------
  AUS    0  307  635  298  414  652  587  432   47  618    8  654  350  317  622  421  203  685
380  413   72  806  250
  BEL  222    0  365  314  334  525  418  353   35  472   35  447  254  265  466  259  137  651
317  372   83  458  175
  CAN  491  323    0  537  767 1458  854  910   77  963   12 1073  603  334 1221  909  428  903
692  683   94 2115  318
  CHE  219  290  379    0  338  660  389  362   29  377   32  442  264  250  487  267  143  557
310  328   66  590  164
  CZE  204  231  454  222    0 1287  876  628   75  919   26  794  643  318 1020  584  325 1036
760  585  119 1176  255
  DEU  245  375  384  391  696    0 1648 1015  116 1669  109 1327  761  463 1957  963  345 1905
1117  803  143 2194  325
  DFS  303  337  492  315  452  566    0  710   83 1195   25 1070  572  450 1199  645  306 1305
814  709  124 1348  332
  ESP  277  316  458  277  405  431  444    0   65  791   13  790  503  328  967  629  299  770
588  644   98 1094  308
  EST   15   25   28   12   35   48   37   27    0   79    0   78   60   40   95   58   32  114
93   64   21  116   31
  FRA  291  415  448  306  474  467  403  469   22    0   16 1146  607  437 1413  899  319 1448
928  665   93 1906  307
  FRR    6   31    8   24   22   83   25    8    0   12    0   20    4    9   30    3    1   85
67   19   13   21    5
  GBR  450  409  980  415  504  551  641  610   31  539   16    0  588  575 1248  698  335 1265
750  733  119 1510  342
  HUN  206  209  490  204  539  415  381  377   33  326    4  455    0  269  721  448  282  614
501  477   77  835  251
  IRL  266  256  308  248  239  306  347  311   19  323    9  625  228    0  439  257  145  535
303  345   63  440  205
  ITA  351  391  723  401  638  836  724  648   40  525   28  868  540  385    0  885  416 1342
944  831  138 2020  350
  JPN  169  138  244  131  147  169  206  193   13  170    3  227  173  137  234    0  329  715
519  458   74 1399  258
  KOR  121   78  366   92  224  146  179  197   13  138    0  238  226   94  326  131    0  303
299  316   53  559  181
  NLD  469  671  670  513  794  867  838  604   64  609   52  946  437  481  922  211  178    0
912  814  136 1734  335
  POL  185  235  399  212  469  485  454  343   45  361   61  466  356  213  584  143  199  591
0  603  112 1049  232
  PRT  269  357  675  291  498  551  594  659   42  564   18  679  453  313  784  189  260  815
546    0   95  910  303
  SVN   45   69   69   49   90  115  102   71   16   63   12   94   59   49  119   37   30  114
90   79    0  120   50
  USA  546  352 1761  484  771  611  678  620   66  740   13 1177  699  398 1088  293  605 1209
690  883   97    0  404
  ZAF  211  150  293  151  190  222  256  285   15  212    4  316  218  196  299  155  144  298
164  288   37  426    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  CZE  DEU  DFS  ESP  EST  FRA  FRR  GBR  HUN  IRL  ITA  JPN  KOR  NLD
NZL  POL  PRT  SVN  USA  ZAF
 --------------------------------------------------------------------------
  AUS    0  304  643  299  415  654  591  442   47  626    8  660  350  320  623  422  203  689
427  382  416   70  814  250
  BEL  222    0  363  314  335  524  417  355   35  466   35  444  254  266  466  255  139  626
200  317  372   81  448  175
  CAN  492  324    0  537  767 1458  854  912   77  963   12 1073  603  334 1221  909  429  903
305  692  683   92 2115  318
  CHE  219  289  379    0  338  660  389  363   29  377   32  442  264  250  487  267  143  557
185  310  328   64  590  164
  CZE  204  231  454  222    0 1287  876  630   75  919   26  794  643  318 1020  584  325 1036
278  760  585  117 1176  255
  DEU  245  375  384  391  696    0 1648 1019  116 1669  109 1327  761  463 1957  963  346 1905
386 1117  803  141 2194  325
  DFS  303  337  492  315  452  566    0  713   83 1195   25 1070  572  450 1199  645  307 1305
400  814  709  123 1348  332
  ESP  278  317  459  278  407  436  445    0   66  795   13  793  503  330  971  631  300  774
261  590  646   97 1097  308
  EST   15   25   28   12   35   48   37   27    0   79    0   78   60   40   95   58   32  114
26   93   64   20  116   31
  FRA  291  415  448  306  474  467  403  472   22    0   16 1146  607  437 1413  899  320 1448
429  928  665   91 1906  307
  FRR    6   31    8   24   22   83   25    8    0   12    0   20    4    9   30    3    1   85
5   67   19   13   21    5
  GBR  451  409  980  415  504  551  641  612   31  539   16    0  588  578 1248  698  335 1265
412  750  733  117 1510  342
  HUN  206  209  490  204  539  415  381  377   33  326    4  455    0  269  721  448  283  614
228  501  477   75  835  251
  IRL  266  256  308  248  239  306  347  313   19  323    9  628  228    0  439  257  145  535
284  303  345   62  440  205
  ITA  351  391  723  401  638  836  724  654   40  525   28  868  540  385    0  885  417 1342
404  944  831  136 2020  350
  JPN  169  138  244  131  147  169  206  194   13  170    3  227  173  137  234    0  329  715
265  519  458   73 1399  258
  KOR  121   78  366   92  224  146  179  197   13  138    0  238  226   94  326  131    0  305
126  300  316   52  561  181
  NLD  469  654  670  513  794  867  838  607   64  609   52  946  437  481  922  211  178    0
522  912  814  134 1734  335
  NZL  299  145  245  149  169  193  231  204   11  186    5  303  173  231  276  105   81  446
0  249  288   39  476  188
  POL  185  235  399  212  469  485  454  344   45  361   61  466  356  213  584  143  199  591
136    0  603  110 1049  232
  PRT  269  358  675  291  498  551  594  663   42  564   18  679  453  313  784  189  260  815
210  546    0   94  910  303
  SVN   45   69   69   49   90  114  102   71   16   63   12   94   58   49  118   37   30  113
30   89   79    0  118   49
  USA  548  353 1761  484  771  611  677  621   66  740   13 1177  699  398 1088  293  605 1209
382  690  883   96    0  404
  ZAF  211  150  293  151  190  222  256  285   15  212    4  316  218  196  299  155  144  298
166  164  288   37  426    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  CZE  DEU  DFS  ESP  EST  FRA  FRR  GBR  HUN  IRL  ITA  JPN  KOR  NLD
POL  PRT  SVN  USA  ZAF
 ----------------------------------------------------------------------------
  AUS    0  309  635  298  414  652  587  432   47  618    8  654  339  317  622  414  205  685
380  413   70  806  250
  BEL  222    0  367  315  336  529  420  353   35  476   35  449  252  267  469  261  140  655
319  374   81  461  176
  CAN  491  324    0  537  766 1458  854  909   77  963   12 1073  589  334 1221  902  431  903
692  683   92 2115  318
  CHE  219  290  379    0  338  660  389  361   29  377   32  442  258  250  487  267  144  557
310  328   64  590  164
  CZE  204  231  454  222    0 1287  876  628   75  919   26  794  630  318 1020  583  326 1036
760  585  117 1175  255
  DEU  245  375  384  391  696    0 1648 1013  116 1669  109 1327  743  463 1957  960  349 1905
1117  803  141 2194  325
  DFS  303  337  492  315  452  566    0  708   83 1195   25 1070  557  450 1199  639  309 1305
814  709  123 1348  332
  ESP  277  315  458  276  405  429  442    0   65  791   13  788  493  328  965  619  301  768
587  642   97 1093  308
  EST   15   25   28   12   35   48   37   27    0   79    0   78   60   40   95   57   32  114
93   64   20  116   31
  FRA  291  415  448  306  474  467  403  469   22    0   16 1146  589  437 1413  886  322 1448
928  665   91 1906  307
  FRR    6   31    8   24   22   83   25    8    0   12    0   20    4    9   30    3    1   85
67   19   13   21    5
  GBR  450  409  980  415  504  551  641  608   31  539   16    0  573  575 1248  693  337 1265
750  733  117 1510  342
  HUN  198  202  476  200  527  406  372  363   33  318    4  439    0  262  708  438  281  596
495  470   75  805  242
  IRL  266  256  308  248  239  306  347  311   19  323    9  625  220    0  439  255  146  535
303  345   62  440  205
  ITA  351  391  723  401  637  836  724  646   40  525   28  868  524  385    0  879  419 1342
944  831  136 2020  350
  JPN  169  138  244  131  147  169  206  193   13  170    3  227  167  137  234    0  330  708
517  457   73 1380  256
  KOR  121   78  366   92  224  146  179  197   13  138    0  238  224   94  326  131    0  307
300  317   52  564  182
  NLD  469  675  670  513  794  867  838  602   64  609   52  946  424  481  922  211  178    0
912  814  134 1734  335
  POL  185  235  399  212  469  485  454  343   45  361   61  466  352  213  584  143  199  591
0  603  110 1049  232
  PRT  269  358  675  291  498  551  594  657   42  564   18  679  445  313  784  189  260  815
546    0   94  910  303
  SVN   45   69   69   49   90  114  102   71   16   63   12   94   58   49  118   37   30  113
89   79    0  118   49
  USA  546  353 1761  484  771  611  678  619   66  740   13 1177  673  398 1088  293  610 1209
690  883   96    0  404
  ZAF  211  150  293  151  190  222  256  285   15  212    4  316  207  196  299  155  144  298
164  288   37  426    0
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HOL
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
      AUS  BEL  CAN  CHE  CZE  DEU  DFS  ESP  EST  FRA  FRR  GBR  IRL  ITA  JPN  KOR  NLD  NZL
POL  PRT  SVN  USA  ZAF
 --------------------------------------------------------------------------
  AUS    0  237  402  239  246  426  359  309   36  366    6  436  227  407  199   87  413  259
239  241   65  418  113
  BEL  203    0  357  295  264  494  372  349   35  456   34  389  223  452  171   73  533  193
245  278   81  368   89
  CAN  344  322    0  502  635 1390  697  912   75  963   12  891  269 1203  607  246  747  299
587  524   92 1702  166
  CHE  198  274  352    0  256  555  341  357   28  374   20  399  213  459  195   73  440  180
231  246   63  490   81
  CZE  144  186  376  166    0 1044  660  522   65  738   25  611  224  858  416  196  846  187
624  438  110  917  153
  DEU  207  364  372  329  565    0 1400  993  112 1595   99 1111  364 1893  682  200 1618  358
953  594  141 1738  162
  DFS  253  309  461  285  367  510    0  607   74  966   25  827  336 1058  404  160 1081  314
654  504  119  951  159
  ESP  227  318  459  277  308  429  396    0   65  795   13  680  261  964  450  167  670  259
489  488   98  927  159
  EST   15   25   28   12   29   47   34   27    0   76    0   66   31   94   45   22  106   24
 80   55   20  106   23
  FRA  224  415  448  304  345  417  365  474   22    0   16  863  326 1381  566  174 1063  420
775  473   91 1216  140
  FRR    5   31    8   16   21   76   25    8    0   12    0   15    9   30    2    1   68    5
 62   13   13   14    5
  GBR  348  367  822  374  385  477  538  504   28  433   13    0  388 1064  443  183  967  303
605  523  115 1133  165
  IRL  216  226  264  218  180  263  286  260   17  258    9  403    0  359  156   63  398  220
219  233   60  315   94
  ITA  284  389  721  384  528  813  660  655   40  517   28  752  327    0  646  243 1171  389
820  630  136 1626  185
  JPN  132  110  201  112  125  141  173  151   13  141    2  181  113  199    0  169  461  149
395  279   61  840  113
  KOR   55   48  207   51  138   83  101   93   10   84    0  120   42  191   75    0  158   58
196  169   40  318   77
  NLD  328  536  554  410  676  740  741  524   60  496   45  712  385  817  169   85    0  396
751  580  131 1120  162
  NZL  209  144  244  146  119  187  199  203   11  186    5  235  188  267   80   41  347    0
170  181   38  302   83
  POL  138  181  340  155  392  388  375  251   36  285   57  372  160  496  121  142  483   92
  0  458  100  853  129
  PRT  178  246  480  200  353  382  395  451   33  374   13  436  202  551  140  142  538  118
415    0   85  625  153
  SVN   44   69   69   49   86  114  100   73   16   63   12   92   49  118   32   25  112   30
 79   70    0  115   40
  USA  347  324 1487  416  603  515  577  515   63  476   11  956  322  950  236  346  768  252
568  592   96    0  192
  ZAF  103   82  148   72  117  109  137  136   13  110    4  143   90  154   86   54  135   72
106  143   30  186    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  CZE  DEU  DFS  ESP  EST  FRA  FRR  GBR  HUN  IRL  ITA  JPN  KOR  NLD
NZL  POL  PRT  SVN  USA
 --------------------------------------------------------------------------
  AUS    0  310  643  299  415  654  591  444   47  510    8  660  350  320  623  422  205  689
427  381  416   47  812
  BEL  222    0  366  314  336  529  419  355   35  439   35  448  256  267  468  261  140  654
203  318  373   54  459
  CAN  492  324    0  537  767 1458  854  913   77  807   12 1073  603  334 1221  909  433  903
305  691  683   69 2107
  CHE  219  290  379    0  338  660  389  363   29  352   32  442  264  250  487  267  144  557
185  309  328   45  587
  CZE  204  231  454  222    0 1287  876  630   75  878   26  794  643  318 1020  584  326 1036
278  760  585   91 1173
  DEU  245  375  384  391  696    0 1648 1024  116 1540  109 1327  761  463 1957  963  349 1905
386 1116  803  109 2187
  DFS  303  337  492  315  452  566    0  715   83 1035   25 1070  572  449 1199  645  310 1305
400  812  709   92 1347
  ESP  280  318  459  279  407  442  448    0   66  718   13  795  503  331  974  631  301  776
263  591  649   71 1095
  EST   15   25   28   12   35   48   37   27    0   74    0   78   60   40   95   58   32  114
 26   93   64   17  115
  FRA  275  401  415  297  459  406  396  468   22    0   14 1011  563  392 1296  745  293 1198
349  869  605   69 1486
  FRR    6   31    8   24   22   83   25    8    0   12    0   20    4    9   30    3    1   85
  5   67   19    8   20
  GBR  451  409  980  415  504  551  641  615   31  527   16    0  588  577 1248  698  337 1265
412  749  733   86 1507
  HUN  206  209  490  204  539  415  381  377   33  324    4  455    0  269  721  448  283  614
228  500  477   60  835
  IRL  266  256  308  248  239  306  347  314   19  319    9  628  228    0  439  257  146  535
284  303  345   42  439
  ITA  351  391  723  401  638  836  724  659   40  505   28  868  540  385    0  885  420 1342
404  944  831  104 2016
  JPN  169  138  244  131  147  169  206  194   13  169    3  227  173  137  234    0  331  715
265  518  458   51 1396
  KOR  121   78  366   92  224  146  179  197   13  135    0  238  226   94  326  131    0  307
128  300  317   40  566
  NLD  469  675  670  513  794  867  838  610   64  549   52  946  437  481  922  211  178    0
522  911  814   97 1731
  NZL  299  145  245  149  169  193  231  205   11  180    5  303  173  231  276  105   81  446
  0  249  288   29  476
  POL  185  235  399  212  469  485  454  345   45  353   61  466  356  213  584  143  199  591
136    0  603   87 1045
  PRT  269  358  675  291  498  551  594  668   42  553   18  679  453  313  784  189  260  815
210  546    0   67  907
  SVN   30   46   52   36   70   89   76   51   12   47    8   68   45   36   88   22   23   81
 23   70   56    0   88
  USA  546  352 1745  481  768  606  675  621   66  582   12 1171  699  397 1082  293  610 1204
380  688  876   74    0
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```

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

	AUS	BEL	CAN	CHE	CZE	DEU	DFS	ESP	EST	FRA	FRR	GBR	HUN	IRL	ITA	JPN	NLD	NZL	POL	PRT	SVN	USA
AUS	0	310	643	299	415	654	591	444	47	626	8	660	350	308	623	422	689	427	382	416	47	814
BEL	222	0	367	315	336	529	420	356	35	476	35	449	256	258	469	261	655	203	319	374	54	461
CAN	492	324	0	537	767	1458	854	913	77	963	12	1073	603	321	1221	909	903	305	692	683	69	2115
CHE	219	290	379	0	338	660	389	363	29	377	32	442	264	242	487	267	557	185	310	328	45	590
CZE	204	231	454	222	0	1287	876	630	75	919	26	794	643	304	1020	584	1036	278	760	585	92	1176
DEU	245	375	384	391	696	0	1648	1024	116	1669	109	1327	761	446	1957	963	1905	386	1117	803	110	2194
DFS	303	337	492	315	452	566	0	715	83	1195	25	1070	572	427	1199	645	1305	400	814	709	93	1348
ESP	280	318	459	279	407	442	448	0	66	796	13	795	503	317	974	631	776	263	591	649	71	1099
EST	15	25	28	12	35	48	37	27	0	79	0	78	60	39	95	58	114	26	93	64	17	116
FRA	291	415	448	306	474	467	403	474	22	0	16	1146	607	409	1413	899	1448	429	928	665	69	1906
FRR	6	31	8	24	22	83	25	8	0	12	0	20	4	9	30	3	85	5	67	19	9	21
GBR	451	408	979	415	503	549	640	612	31	538	16	0	588	541	1248	698	1265	412	750	733	87	1510
HUN	206	209	490	204	539	415	381	377	33	326	4	455	0	259	721	448	614	228	501	477	60	835
IRL	265	255	307	246	238	304	346	311	19	318	9	605	226	0	424	243	500	270	293	333	42	414
ITA	351	391	723	401	638	836	724	659	40	525	28	866	540	382	0	885	1342	404	944	831	105	2020
JPN	169	138	244	131	147	169	206	194	13	170	3	227	173	137	234	0	715	265	519	458	51	1399
NLD	469	675	670	513	794	867	838	610	64	609	52	944	437	473	922	211	0	522	912	814	98	1734
NZL	299	145	245	149	169	193	231	205	11	186	5	303	173	227	276	105	446	0	249	288	29	476
POL	185	235	399	212	469	485	454	345	45	361	61	466	356	213	584	143	591	136	0	603	88	1049
PRT	269	358	675	291	498	551	594	668	42	564	18	678	453	312	784	189	815	210	546	0	67	910
SVN	30	46	52	36	70	89	76	51	12	47	8	68	45	36	89	22	82	23	70	56	0	89
USA	548	353	1761	484	771	611	678	623	66	740	13	1177	699	392	1088	293	1209	382	690	883	74	0

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HOL
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
      AUS  BEL  CAN  CHE  CZE  DEU  DFS  ESP  EST  FRA  GBR  HUN  IRL  ITA  JPN  NLD  POL  PRT
SVN  USA
 ----------------------------------------------------------------------------
  AUS    0  302  635  298  414  652  587  448   47  494  654  339  305  622  414  665  378  413
47  804
  BEL  222    0  361  313  335  523  415  358   35  430  442  249  256  464  251  614  315  370
54  443
  CAN  491  324    0  537  766 1458  854  919   77  791 1073  589  321 1221  893  871  691  683
69 2107
  CHE  219  289  379    0  338  660  389  367   29  342  442  258  242  487  266  546  308  328
45  588
  CZE  204  231  454  222    0 1287  876  643   75  870  794  630  304 1020  581 1025  760  585
91 1173
  DEU  245  375  384  391  696    0 1648 1050  116 1524 1327  743  446 1957  956 1865 1110  803
109 2188
  DFS  303  337  492  315  452  566    0  735   83 1020 1070  557  427 1198  634 1278  812  709
92 1334
  ESP  286  332  464  284  426  482  471    0   68  723  814  503  329  999  626  783  608  679
73 1116
  EST   15   25   28   12   35   48   37   30    0   74   78   60   39   95   57  112   93   64
17  116
  FRA  253  391  390  278  443  383  378  474   22    0  992  549  371 1279  727 1161  863  593
69 1460
  GBR  450  408  979  415  503  549  640  638   31  488    0  573  538 1248  686 1240  749  733
86 1503
  HUN  198  202  476  200  527  406  372  375   33  307  439    0  254  708  437  589  494  470
60  805
  IRL  265  255  307  246  238  304  346  328   19  294  602  219    0  424  239  495  293  333
42  412
  ITA  351  391  723  401  637  836  724  701   40  471  866  524  382    0  876 1317  944  831
104 2011
  JPN  169  138  244  131  147  169  206  196   13  165  227  167  137  234    0  676  516  452
51 1347
  NLD  446  633  623  495  777  837  815  613   63  498  906  408  463  884  209    0  898  799
97 1622
  POL  185  235  399  212  469  485  454  366   45  346  466  352  213  584  143  583    0  603
87 1046
  PRT  269  358  675  291  498  551  594  715   42  531  678  445  312  784  189  789  546    0
67  909
  SVN   30   46   52   36   70   89   76   54   12   47   68   45   36   88   22   81   70   56
0   88
  USA  546  351 1761  484  770  609  678  637   66  540 1176  673  392 1088  293 1000  690  881
74    0
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HOL
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
      BEL  CAN  CHE  CZE  DEU  DFS  ESP  FRA  GBR  IRL  ITA  KOR  NLD  PRT  SVN  USA
    -------------------------------------------------------------------------------
   BEL    0  329  243  254  380  380  316  402  408  242  294   56  487  260   32  400
   CAN  314    0  404  616 1049  759  799  761  975  306  857  165  681  508   42 1918
   CHE  227  284    0  228  421  293  278  278  341  186  323   49  371  219   28  437
   CZE  184  366  150    0  900  668  508  714  622  230  630  128  812  413   55  934
   DEU  289  304  251  503    0 1098  773 1110  916  308 1073  128 1253  477   68 1505
   DFS  326  489  244  358  432    0  631 1016 1057  424  652  113 1044  503   59 1325
   ESP  299  393  199  310  333  416    0  656  698  283  635  118  626  478   48  976
   FRA  384  388  223  334  290  378  434    0  989  370  717  116  965  450   45 1459
   GBR  391  906  307  379  396  638  524  489    0  533  737  127  977  532   58 1491
   IRL  247  304  182  177  221  346  279  294  596    0  253   46  418  234   24  411
   ITA  276  533  264  407  429  475  397  336  533  250    0  156  710  458   60 1142
   KOR   38  149   35   89   64   73   73   61   83   32  129    0  114  125   20  206
   NLD  492  522  338  646  582  735  478  455  714  399  532   64    0  544   62 1147
   PRT  239  472  180  328  347  388  453  363  429  199  414  107  506    0   44  653
   SVN   31   32   21   45   58   50   37   29   48   22   53   13   50   35    0   57
   USA  339 1646  349  594  429  677  500  540 1174  392  686  220  739  594   46    0
    -------------------------------------------------------------------------------
HOL
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
      BEL  CAN  CHE  CZE  DEU  DFS  ESP  FRA  FRR  GBR  IRL  ITA  JPN  KOR  NLD  PRT  USA
    -------------------------------------------------------------------------------
   BEL    0  270  301  232  388  253  329  289   32  426  229  323  127   72  558  158  420
   CAN  264    0  369  487  901  319  604  481    7  666  201  806  416  218  534  282 1284
   CHE  282  288    0  231  494  228  334  237   32  408  208  378  140   73  502  136  548
   CZE  167  319  154    0  840  426  456  520   25  553  175  659  314  188  769  252  841
   DEU  293  291  306  477    0  761  776  902   57  921  269 1212  490  183 1304  312 1514
   DFS  202  242  184  226  291    0  389  417    4  618  253  506  201  109  781  212  685
   ESP  308  326  253  260  315  249    0  474   13  727  274  714  346  165  678  271 1025
   FRA  251  254  192  251  245  162  300    0   10  578  196  699  368  137  705  227  856
   FRR   30    6   24   21   43    4    8    8    0   19    6   21    2    1   71    7   20
   GBR  400  643  383  336  399  342  568  298   16    0  472  829  332  183 1124  315 1456
   IRL  232  217  213  133  204  192  276  166    6  529    0  254   96   55  411  113  370
   ITA  301  517  306  421  450  338  431  296   19  585  243    0  442  232  825  328 1317
   JPN   81  155   78  102  107   96  115  102    2  139   73  151    0  148  326  155  642
   KOR   48  196   51  133   82   64   93   82    0  120   36  188   74    0  156  140  316
   NLD  568  466  468  613  610  495  527  343   49  836  387  589  128   85    0  315 1357
   PRT  140  271  105  202  212  155  222  186    7  237   92  279   93  115  265    0  393
   USA  346 1208  458  538  431  343  568  311   13 1163  358  770  182  347  883  369    0
    -------------------------------------------------------------------------------
JER
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
      AUS  CAN  DFS  GBR  ITA  NLD  NZL  USA  ZAF
    -------------------------------------------------------------------------------
   AUS    0  107   61   73   38   14  124  193  103
   CAN  111    0   57   92   44   11   61  271  103
   DFS   38   40    0   71   49   13   69  110   88
   GBR   72   95   62    0   47   10   62  119   79
   ITA   36   41   45   45    0   13   33   58   54
   NLD   11    7    8    8   10    0   14   24   21
   NZL  120   64   47   62   28   12    0  128   88
   USA  182  265   75  122   61   25  138    0  190
   ZAF  107  103   67   76   54   17   84  201    0
    -------------------------------------------------------------------------------
```

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JER
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
      AUS   CAN   DFS   GBR   ITA   NLD   NZL   USA   ZAF
--------------------------------------------------------------------------------
  AUS     0   107    61    73    38    14   124   193    96
  CAN   111     0    57    92    44    11    61   271    92
  DFS    38    40     0    71    49    13    69   110    79
  GBR    72    95    62     0    47    10    62   119    74
  ITA    36    41    45    45     0    13    33    58    54
  NLD    11     7     8     8    10     0    14    24    21
  NZL   120    64    47    62    28    12     0   128    79
  USA   182   265    75   122    61    25   138     0   170
  ZAF   102    94    62    72    54    17    76   182     0
--------------------------------------------------------------------------------
JER
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
      AUS   CAN   DFS   GBR   ITA   NLD   NZL   ZAF
--------------------------------------------------------------------------------
  AUS     0    99    55    67    34    13   119    94
  CAN   106     0    53    87    39     9    57    87
  DFS    37    39     0    66    46    10    68    76
  GBR    70    93    61     0    45     9    60    67
  ITA    34    38    45    45     0    11    31    51
  NLD    11     7     7     7     9     0    13    17
  NZL   114    60    47    60    28    12     0    79
  ZAF   101    91    59    69    52    15    76     0
--------------------------------------------------------------------------------
JER
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
      AUS   CAN   DFS   GBR   ITA   NLD   USA   ZAF
--------------------------------------------------------------------------------
  AUS     0   107    59    72    38     1   193   102
  CAN   111     0    57    92    44     2   271   103
  DFS    36    40     0    69    49     3   110    87
  GBR    71    95    60     0    47     3   119    79
  ITA    36    41    45    45     0     3    58    54
  NLD     1     2     3     3     3     0     6     5
  USA   182   265    75   122    61     6     0   190
  ZAF   106   103    66    76    54     5   201     0
--------------------------------------------------------------------------------
JER
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
      AUS   CAN   DFS   GBR   ITA   NLD   NZL   USA   ZAF
--------------------------------------------------------------------------------
  AUS     0   107    61    73    38    14   124   193   103
  CAN   111     0    57    92    44    11    61   271   103
  DFS    38    40     0    71    49    13    69   110    88
  GBR    72    95    62     0    47    10    62   119    79
  ITA    36    41    45    45     0    13    33    58    54
  NLD    11     7     8     8    10     0    14    24    21
  NZL   120    64    47    62    28    12     0   128    88
  USA   182   265    75   122    61    25   138     0   190
  ZAF   107   103    67    76    54    17    84   201     0
--------------------------------------------------------------------------------
```

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JER
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
      AUS   CAN   DFS   GBR   ITA   NLD   NZL   USA   ZAF
--------------------------------------------------------------------------------
   AUS     0   107    61    73    38    14   124   193   103
   CAN   111     0    57    92    44    11    61   271   103
   DFS    38    40     0    71    49    13    69   110    88
   GBR    72    95    62     0    47    10    62   119    79
   ITA    36    41    45    45     0    13    33    58    54
   NLD    11     7     8     8    10     0    14    24    21
   NZL   120    64    47    62    28    12     0   128    88
   USA   182   265    75   122    61    25   138     0   190
   ZAF   107   103    67    76    54    17    84   201     0
--------------------------------------------------------------------------------
JER
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
      AUS   CAN   DFS   GBR   ITA   NLD   NZL   USA   ZAF
--------------------------------------------------------------------------------
   AUS     0   107    61    73    38    14   124   193   103
   CAN   111     0    57    92    44    11    61   271   103
   DFS    38    40     0    71    49    13    69   110    88
   GBR    72    95    62     0    47    10    62   119    79
   ITA    36    41    45    45     0    13    33    58    54
   NLD    11     7     8     8    10     0    14    24    21
   NZL   120    64    47    62    28    12     0   128    88
   USA   182   265    75   122    61    25   138     0   190
   ZAF   107   103    67    76    54    17    84   201     0
--------------------------------------------------------------------------------
JER
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
      AUS   CAN   DFS   ITA   NLD   ZAF
--------------------------------------------------------------------------------
   AUS     0    64    33    26     8    60
   CAN    63     0    51    37     8    70
   DFS    25    36     0    45     9    54
   ITA    25    36    44     0    11    44
   NLD     7     6     6     8     0    12
   ZAF    64    68    40    44    10     0
--------------------------------------------------------------------------------
JER
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
      AUS   CAN   DFS   GBR   ITA   NLD   USA   ZAF
--------------------------------------------------------------------------------
   AUS     0   105    59    71    38    14   192   102
   CAN   109     0    57    92    44    11   271   103
   DFS    36    40     0    69    49    13   110    87
   GBR    70    95    60     0    47    10   119    79
   ITA    36    41    45    45     0    13    58    54
   NLD    11     7     8     8    10     0    24    21
   USA   181   265    75   122    61    25     0   190
   ZAF   106   103    66    76    54    17   201     0
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```

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JER
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
      AUS   CAN   DFS   GBR   ITA   NLD   NZL   USA   ZAF
 ------------------------------------------------------------------------------
  AUS     0   107    61    73    38    14   124   193   103
  CAN   111     0    57    92    44    11    61   271   103
  DFS    38    40     0    71    49    13    69   110    88
  GBR    72    95    62     0    47    10    62   119    79
  ITA    36    41    45    45     0    13    33    58    54
  NLD    11     7     8     8    10     0    14    24    21
  NZL   120    64    47    62    28    12     0   128    88
  USA   182   265    75   122    61    25   138     0   190
  ZAF   107   103    67    76    54    17    84   201     0
 ------------------------------------------------------------------------------
JER
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
      AUS   CAN   DFS   GBR   ITA   NLD   NZL   USA   ZAF
 ------------------------------------------------------------------------------
  AUS     0   107    59    73    38    14   124   193   103
  CAN   111     0    51    92    44    11    61   271   103
  DFS    37    38     0    61    49    13    62   103    80
  GBR    72    95    56     0    47    10    61   119    78
  ITA    36    41    45    45     0    13    33    58    54
  NLD    11     7     8     8    10     0    14    24    21
  NZL   120    64    42    61    28    12     0   128    87
  USA   182   265    71   122    61    25   138     0   190
  ZAF   107   103    64    75    54    17    83   201     0
 ------------------------------------------------------------------------------
JER
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
      AUS   CAN   DFS   GBR   ITA   NLD   NZL   USA   ZAF
 ------------------------------------------------------------------------------
  AUS     0   107    61    73    38    14   124   193   103
  CAN   111     0    57    92    44    11    61   271   103
  DFS    38    40     0    71    49    13    69   110    88
  GBR    72    95    62     0    47    10    62   119    79
  ITA    36    41    45    45     0    13    33    58    54
  NLD    11     7     8     8    10     0    14    24    21
  NZL   120    64    47    62    28    12     0   128    88
  USA   182   265    75   122    61    25   138     0   190
  ZAF   107   103    67    76    54    17    84   201     0
 ------------------------------------------------------------------------------
JER
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
      AUS   CAN   DFS   GBR   ITA   NLD   USA   ZAF
 ------------------------------------------------------------------------------
  AUS     0   105    59    71    38    14   192   102
  CAN   109     0    57    92    44    11   268   103
  DFS    36    40     0    69    49    13   110    87
  GBR    70    94    60     0    47    10   119    79
  ITA    36    41    45    45     0    13    58    54
  NLD    11     7     8     8    10     0    24    21
  USA   181   263    75   122    61    25     0   190
  ZAF   106   103    66    76    54    17   201     0
 ------------------------------------------------------------------------------
```

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JER
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
       AUS   CAN   DFS   GBR   ITA   NLD   NZL   USA   ZAF
------------------------------------------------------------------------------
   AUS     0   107    61    73    38    14   124   193   103
   CAN   111     0    57    92    44    11    61   271   103
   DFS    38    40     0    71    49    13    69   110    88
   GBR    72    95    62     0    47    10    62   119    79
   ITA    36    41    45    45     0    13    33    58    54
   NLD    11     7     8     8    10     0    14    24    21
   NZL   120    64    47    62    28    12     0   128    88
   USA   182   265    75   122    61    25   138     0   190
   ZAF   107   103    67    76    54    17    84   201     0
------------------------------------------------------------------------------
JER
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
       AUS   CAN   DFS   GBR   ITA   NLD   USA   ZAF
------------------------------------------------------------------------------
   AUS     0   105    59    71    38    14   192    95
   CAN   109     0    57    92    44    11   271    92
   DFS    36    40     0    69    49    13   110    78
   GBR    70    95    60     0    47    10   119    74
   ITA    36    41    45    45     0    13    58    54
   NLD    11     7     8     8    10     0    24    21
   USA   181   265    75   122    61    25     0   170
   ZAF   101    94    61    72    54    17   182     0
------------------------------------------------------------------------------
JER
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
       AUS   CAN   DFS   NLD   NZL   ZAF
------------------------------------------------------------------------------
   AUS     0    60    29     8    68    59
   CAN    58     0    42     9    57    83
   DFS    20    33     0    10    55    67
   NLD     7     6     7     0    13    15
   NZL    60    59    38    11     0    75
   ZAF    64    83    51    13    67     0
------------------------------------------------------------------------------
JER
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
       AUS   CAN   DFS   GBR   ITA   NLD   NZL   USA
------------------------------------------------------------------------------
   AUS     0   107    61    33    38    14   124   193
   CAN   111     0    57    37    44    11    61   271
   DFS    38    40     0    29    49    13    69   110
   GBR    37    43    27     0    14     4    33    37
   ITA    36    41    45    15     0    13    33    58
   NLD    11     7     8     5    10     0    14    24
   NZL   120    64    47    36    28    12     0   128
   USA   182   265    75    40    61    25   138     0
------------------------------------------------------------------------------
```

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JER
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
       AUS   CAN   DFS   GBR   NLD   NZL   USA
 ----------------------------------------------------------------------------
  AUS     0   107    61    73    14   124   193
  CAN   111     0    57    92    11    61   268
  DFS    38    40     0    71    13    69   110
  GBR    72    94    62     0    10    61   119
  NLD    11     7     8     8     0    14    24
  NZL   120    64    47    61    12     0   128
  USA   182   263    75   122    25   138     0
 ----------------------------------------------------------------------------
JER
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
       AUS   CAN   DFS   GBR   ITA   NLD   USA
 ----------------------------------------------------------------------------
  AUS     0   105    59    71    38    14   191
  CAN   109     0    57    92    44    11   271
  DFS    36    40     0    69    49    13   110
  GBR    70    94    60     0    47    10   119
  ITA    36    41    45    45     0    13    58
  NLD    11     7     8     8    10     0    24
  USA   180   265    75   122    61    25     0
 ----------------------------------------------------------------------------
--------
RDC
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
       AUS   CAN   DEU   DFS   GBR   NLD   NOR   NZL   USA
 ----------------------------------------------------------------------------
  AUS     0    21     7    33     7     5    13    16    10
  CAN    20     0     6    81    47     2     3    29   110
  DEU     7     6     0    28     0     6     7     3     0
  DFS    24    76    18     0    29    16    65    50    48
  GBR     6    46     0    27     0     0     0    19    35
  NLD     5     2     5    16     0     0    13     2     1
  NOR    10     3     6    52     0    12     0     8     0
  NZL    16    27     3    48    16     2     7     0    18
  USA    10   103     0    45    32     1     0    17     0
 ----------------------------------------------------------------------------
RDC
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
       AUS   CAN   DEU   DFS   GBR   NLD   NZL   USA
 ----------------------------------------------------------------------------
  AUS     0    21     7    33     7     5    16    10
  CAN    20     0     6    81    47     2    29   110
  DEU     7     6     0    28     0     4     3     0
  DFS    24    76    18     0    29    14    47    48
  GBR     6    46     0    27     0     0    19    35
  NLD     5     2     3    14     0     0     2     1
  NZL    16    27     3    45    16     2     0    18
  USA    10   103     0    45    32     1    17     0
 ----------------------------------------------------------------------------
```

```
RDC
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
       AUS   CAN   DEU   DFS   GBR   NLD   NOR   NZL   USA
 -----------------------------------------------------------------------------
   AUS    0    21     7    33     7     5     3    16    10
   CAN   20     0     6    81    47     2     0    29   108
   DEU    7     6     0    28     0     5     2     3     0
   DFS   24    76    18     0    29    14    30    47    48
   GBR    6    46     0    27     0     0     0    19    34
   NLD    5     2     4    14     0     0    10     2     1
   NOR    3     0     1    21     0     9     0     2     0
   NZL   16    27     3    45    16     2     2     0    18
   USA   10   102     0    45    31     1     0    17     0
 -----------------------------------------------------------------------------
RDC
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
       AUS   CAN   DEU   DFS   GBR   NLD   USA
 -----------------------------------------------------------------------------
   AUS    0    21     7    33     7     5    10
   CAN   20     0     6    81    47     2   110
   DEU    7     6     0    28     0     4     0
   DFS   24    76    18     0    29    13    48
   GBR    6    46     0    27     0     0    35
   NLD    5     2     3    13     0     0     1
   USA   10   103     0    45    32     1     0
 -----------------------------------------------------------------------------
RDC
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
       AUS   CAN   DEU   DFS   GBR   NLD   NOR   NZL   USA
 -----------------------------------------------------------------------------
   AUS    0    21     7    33     7     5    13    16    10
   CAN   20     0     6    81    47     2     3    29   110
   DEU    7     6     0    28     0     6     7     3     0
   DFS   24    76    18     0    29    15    73    46    48
   GBR    6    46     0    27     0     0     0    19    35
   NLD    5     2     5    15     0     0    13     2     1
   NOR   10     3     6    58     0    12     0     8     0
   NZL   16    27     3    42    16     2     7     0    18
   USA   10   103     0    45    32     1     0    17     0
 -----------------------------------------------------------------------------
RDC
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
       AUS   CAN   DEU   DFS   GBR   NLD   NZL   USA
 -----------------------------------------------------------------------------
   AUS    0    21     7    33     7     5    16    10
   CAN   20     0     6    81    47     2    29   110
   DEU    7     6     0    28     0     6     3     0
   DFS   24    76    18     0    29    15    47    48
   GBR    6    46     0    27     0     0    19    35
   NLD    5     2     5    15     0     0     2     1
   NZL   16    27     3    45    16     2     0    18
   USA   10   103     0    45    32     1    17     0
 -----------------------------------------------------------------------------
```

```
RDC
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
       AUS   CAN   DEU   DFS   GBR   NLD   NOR   NZL   USA
-----------------------------------------------------------------------------
   AUS     0    21     7    33     7     5    13    16    10
   CAN    20     0     6    81    47     2     3    29   110
   DEU     7     6     0    28     0     6     7     3     0
   DFS    24    76    18     0    29    16    76    50    48
   GBR     6    46     0    27     0     0     0    19    35
   NLD     5     2     5    16     0     0    13     2     1
   NOR    10     3     6    60     0    12     0     8     0
   NZL    16    27     3    48    16     2     7     0    18
   USA    10   103     0    45    32     1     0    17     0
-----------------------------------------------------------------------------
RDC
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
       AUS   CAN   DEU   DFS   NLD   NOR
-----------------------------------------------------------------------------
   AUS     0    10     7    21     5    11
   CAN    10     0     6    80     2     3
   DEU     7     6     0    28     4     7
   DFS    15    75    18     0    13    73
   NLD     5     2     3    13     0    13
   NOR     9     3     6    58    12     0
-----------------------------------------------------------------------------
RDC
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
       AUS   CAN   DEU   DFS   GBR   NLD   NOR   USA
-----------------------------------------------------------------------------
   AUS     0    21     4    33     7     5    13    10
   CAN    20     0     3    81    47     2     3   110
   DEU     4     3     0    15     0     4     5     0
   DFS    24    76     9     0    29    14    73    48
   GBR     6    46     0    27     0     0     0    35
   NLD     5     2     3    14     0     0    13     1
   NOR    10     3     4    58     0    12     0     0
   USA    10   103     0    45    32     1     0     0
-----------------------------------------------------------------------------
RDC
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
       AUS   CAN   DEU   DFS   GBR   NLD   NOR   NZL   USA
-----------------------------------------------------------------------------
   AUS     0    21     7    33     7     5    13    16    10
   CAN    20     0     6    81    47     2     3    29   110
   DEU     7     6     0    28     0     4     7     3     0
   DFS    24    76    18     0    29    14    76    50    48
   GBR     6    46     0    27     0     0     0    19    35
   NLD     5     2     3    14     0     0    13     2     1
   NOR    10     3     6    60     0    12     0     8     0
   NZL    16    27     3    48    16     2     7     0    18
   USA    10   103     0    45    32     1     0    17     0
-----------------------------------------------------------------------------
```

```
RDC
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
       AUS   CAN   DEU   DFS   GBR   NLD   NOR   NZL   USA
 ------------------------------------------------------------------------------
   AUS    0    21     7    33     7     5    13    16    10
   CAN   20     0     6    81    47     2     3    29   110
   DEU    7     6     0    28     0     5     7     3     0
   DFS   24    76    18     0    29    14    73    47    48
   GBR    6    46     0    27     0     0     0    19    35
   NLD    5     2     4    14     0     0    13     2     1
   NOR   10     3     6    58     0    12     0     8     0
   NZL   16    27     3    44    16     2     7     0    18
   USA   10   103     0    45    32     1     0    17     0
 ------------------------------------------------------------------------------
RDC
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
       AUS   CAN   DEU   DFS   GBR   NLD   NOR   NZL   USA
 ------------------------------------------------------------------------------
   AUS    0    21     7    33     7     5    13    16    10
   CAN   20     0     6    81    47     2     3    29   110
   DEU    7     6     0    28     0     6     7     3     0
   DFS   24    76    18     0    29    16    66    50    48
   GBR    6    46     0    27     0     0     0    19    35
   NLD    5     2     5    16     0     0    13     2     1
   NOR   10     3     6    53     0    12     0     8     0
   NZL   16    27     3    48    16     2     7     0    18
   USA   10   103     0    45    32     1     0    17     0
 ------------------------------------------------------------------------------
RDC
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
       AUS   CAN   DEU   DFS   GBR   NLD   NOR   USA
 ------------------------------------------------------------------------------
   AUS    0    21     7    33     7     5    13    10
   CAN   20     0     6    81    47     2     3   107
   DEU    7     6     0    28     0     6     7     0
   DFS   24    76    18     0    29    16    76    48
   GBR    6    46     0    27     0     0     0    35
   NLD    5     2     5    16     0     0    13     1
   NOR   10     3     6    60     0    12     0     0
   USA   10   102     0    45    32     1     0     0
 ------------------------------------------------------------------------------
RDC
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
       AUS   CAN   DEU   DFS   GBR   NLD   NOR   NZL   USA
 ------------------------------------------------------------------------------
   AUS    0    21     7    33     7     5    13    16    10
   CAN   20     0     6    81    47     2     3    29   110
   DEU    7     6     0    28     0     6     7     3     0
   DFS   24    76    18     0    29    15    73    47    48
   GBR    6    46     0    27     0     0     0    19    35
   NLD    5     2     5    15     0     0    13     2     1
   NOR   10     3     6    58     0    12     0     8     0
   NZL   16    27     3    45    16     2     7     0    18
   USA   10   103     0    45    32     1     0    17     0
 ------------------------------------------------------------------------------
```

```
RDC
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
       AUS   CAN   DEU   DFS   GBR   NLD   NOR   USA
------------------------------------------------------------------------------
   AUS    0    21     7    33     7     5    13    10
   CAN   20     0     6    81    47     2     3   108
   DEU    7     6     0    28     0     6     7     0
   DFS   24    76    18     0    29    16    70    48
   GBR    6    46     0    27     0     0     0    34
   NLD    5     2     5    16     0     0    13     1
   NOR   10     3     6    55     0    12     0     0
   USA   10   102     0    45    31     1     0     0
------------------------------------------------------------------------------
RDC
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
       AUS   CAN   DEU   DFS   NLD   NOR   NZL
------------------------------------------------------------------------------
   AUS    0     7     6    17     5     9     6
   CAN    7     0     5    75     2     3    29
   DEU    6     5     0    21     4     7     3
   DFS   12    69    15     0    13    65    41
   NLD    5     2     3    13     0    13     1
   NOR    7     3     6    53    12     0     8
   NZL    6    27     3    41     1     7     0
------------------------------------------------------------------------------
RDC
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
       AUS   CAN   DEU   DFS   GBR   NLD   NOR   NZL   USA
------------------------------------------------------------------------------
   AUS    0    21     7    33     7     5    13    16    10
   CAN   20     0     6    81    44     2     3    29   110
   DEU    7     6     0    28     0     6     7     3     0
   DFS   24    76    18     0    29    16    75    48    48
   GBR    6    43     0    27     0     0     0    16    33
   NLD    5     2     5    16     0     0    13     2     1
   NOR   10     3     6    60     0    12     0     8     0
   NZL   16    27     3    46    13     2     7     0    18
   USA   10   103     0    45    30     1     0    17     0
------------------------------------------------------------------------------
RDC
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
       AUS   CAN   DEU   DFS   GBR   NLD   NOR   NZL   USA
------------------------------------------------------------------------------
   AUS    0    21     7    33     7     5    13    16    10
   CAN   20     0     6    81    44     2     3    29   107
   DEU    7     6     0    28     0     6     7     3     0
   DFS   24    76    18     0    29    16    76    50    48
   GBR    6    43     0    27     0     0     0    16    33
   NLD    5     2     5    16     0     0    13     2     1
   NOR   10     3     6    60     0    12     0     8     0
   NZL   16    27     3    48    13     2     7     0    18
   USA   10   102     0    45    30     1     0    17     0
------------------------------------------------------------------------------
```

```
RDC
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
      AUS   CAN   DEU   DFS   GBR   NLD   NOR   USA
------------------------------------------------------------------------------
  AUS    0    21     7    33     7     5    13    10
  CAN   20     0     6    81    44     2     3   110
  DEU    7     6     0    28     0     6     7     0
  DFS   24    76    18     0    29    16    76    48
  GBR    6    43     0    27     0     0     0    33
  NLD    5     2     5    16     0     0    13     1
  NOR   10     3     6    60     0    12     0     0
  USA   10   103     0    45    30     1     0     0
------------------------------------------------------------------------------
```