# Sasirekha_Aug_SVAP_Asmt_R2.Rmd

*Sasirekha*

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# Frame

## World Happiness Report Analysis

## Happiness and Open data

- 1st part - Is happiness correlated with open data?.
- 2nd part - Are open countries happy countries?.
- 3rd part - Happiness Trends
- 4th part - What other measures are correlated with “Openness”?
- 5th part - Which factor does the happiness score depends upon ?

# Acquire

## Read in data files from open-data and world-happiness datasets

## Getting data from 2015 Global Open data index by country - csv file

```
setwd("D:/Big Data/Sasi Big Data")
openData=read.csv("2015-Global-Open-Data-Index.csv",header=TRUE)
openData
```

| | Country.Code | Country.Name | X2015.Rank |
|---|---|---|---|
| 1 | TW | Taiwan | 1 |
| 2 | GB | United Kingdom | 2 |
| 3 | DK | Denmark | 3 |
| 4 | CO | Colombia | 4 |
| 5 | FI | Finland | 5 |
| 6 | AU | Australia | 5 |
| 7 | UY | Uruguay | 7 |
| 8 | US | United States | 8 |
| 9 | NL | Netherlands | 8 |
| 10 | NO | Norway | 10 |
| 11 | FR | France | 10 |
| 12 | BR | Brazil | 12 |
| 13 | RO | Romania | 13 |
| 14 | MX | Mexico | 13 |
| 15 | IM | Isle of Man | 15 |
| 16 | BG | Bulgaria | 16 |
| 17 | CA | Canada | 17 |
| 18 | ES | Spain | 17 |
| 19 | IN | India | 17 |
| 20 | IT | Italy | 17 |
| 21 | CZ | Czech Republic | 21 |
| 22 | MD | Moldova, Republic of | 22 |
| 23 | KR | Korea, Republic of | 23 |
| 24 | AT | Austria | 23 |
| 25 | SG | Singapore | 23 |
| 26 | DE | Germany | 26 |
| 27 | IS | Iceland | 27 |
| 28 | SE | Sweden | 27 |
| 29 | CH | Switzerland | 29 |
| 30 | CL | Chile | 29 |
| 31 | IE | Ireland | 31 |
| 32 | JP | Japan | 31 |
| 33 | LV | Latvia | 31 |
| 34 | KG | Kyrgyzstan | 34 |
| 35 | BE | Belgium | 35 |
| 36 | KO | Kosovo | 35 |
| 37 | JM | Jamaica | 37 |
| 38 | AL | Albania | 37 |
| 39 | HK | Hong Kong | 37 |
| 40 | LU | Luxembourg | 40 |
| 41 | ID | Indonesia | 41 |
| 42 | TH | Thailand | 42 |
| 43 | GR | Greece | 42 |
| 44 | IL | Israel | 44 |
| 45 | RW | Rwanda | 44 |
| 46 | PR | Puerto Rico | 44 |
| 47 | TR | Turkey | 47 |
| 48 | GE | Georgia | 47 |
| 49 | JE | Jersey | 49 |
| 50 | GG | Guernsey | 50 |
| 51 | KZ | Kazakhstan | 50 |
| 52 | SK | Slovakia | 50 |
| 53 | PY | Paraguay | 50 |
| 54 | ZA | South Africa | 54 |
| 55 | AR | Argentina | 54 |
| 56 | PT | Portugal | 54 |
| 57 | UA | Ukraine | 54 |
| 58 | SN | Senegal | 58 |
| 59 | BF | Burkina Faso | 58 |
| 60 | EC | Ecuador | 58 |
| 61 | PK | Pakistan | 61 |
| 62 | RU | Russian Federation | 61 |
| 63 | KY | Cayman Islands | 61 |
| 64 | BJ | Benin | 61 |
| 65 | NP | Nepal | 61 |
| 66 | BM | Bermuda | 66 |
| 67 | OM | Oman | 66 |
| 68 | CR | Costa Rica | 66 |
| 69 | MK | Macedonia, the Former Yugoslav Republic of | 69 |
| 70 | BO | Bolivia, Plurinational State of | 69 |
| 71 | KE | Kenya | 71 |
| 72 | LC | Saint Lucia | 71 |
| 73 | DM | Dominica | 71 |
| 74 | GT | Guatemala | 71 |
| 75 | SV | El Salvador | 71 |
| 76 | MA | Morocco | 76 |
| 77 | DO | Dominican Republic | 76 |
| 78 | PH | Philippines | 78 |

```
## 79           CM                                Cameroon        78
## 80           BH                                 Bahrain        78
## 81           AZ                              Azerbaijan        78
## 82           GY                                  Guyana        82
## 83           TT                    Trinidad and Tobago         83
## 84           EG                                   Egypt        83
## 85           TJ                                Tajikistan      83
## 86           TN                                  Tunisia       86
## 87           QA                                   Qatar        86
## 88           JO                                  Jordan        88
## 89           PA                                  Panama        88
## 90           BW                                Botswana        90
## 91           TZ            Tanzania, United Republic of        90
## 92           ML                                    Mali        90
## 93           CN                                   China        93
## 94           TL                              Timor-Leste       93
## 95           KW                                  Kuwait        93
## 96           TG                                    Togo        96
## 97           MS                               Montserrat       96
## 98           CI                             CÃ´te d'Ivoire     98
## 99           LB                                 Lebanon        98
## 100          AE                     United Arab Emirates       98
## 101          GN                                  Guinea        98
## 102          NE                                   Niger        98
## 103          SA                             Saudi Arabia       103
## 104          GD                                 Grenada        103
## 105          VC            St. Vincent & the Grenadines       105
## 106          AW                                   Aruba        106
## 107          ET                                Ethiopia        106
## 108          KH                                Cambodia        108
## 109          BB                                Barbados        109
## 110          BS                                 Bahamas        109
## 111          IQ                                    Iraq        109
## 112          MY                                Malaysia        112
## 113          NG                                 Nigeria        113
## 114          SD                                   Sudan        113
## 115          TC                  Turks and Caicos Islands      113
## 116          AG                       Antigua and Barbuda      116
## 117          DZ                                 Algeria        117
## 118          IR                 Iran, Islamic Republic of      117
## 119          KN                     Saint Kitts and Nevis      117
## 120          LY                                   Libya        120
## 121          SY                                   Syria        121
## 122          MM                                 Myanmar        122
## 123          NZ                             New Zealand        123
## 124          SI                                Slovenia        123
## 125          HU                                 Hungary        123
## 126          MT                                   Malta        123
## 127          RS                                  Serbia        123
## 128          PL                                  Poland        123
## 129          HR                                 Croatia        123
## 130          BD                              Bangladesh        123
## 131          LT                               Lithuania        123
## 132          VI                    Virgin Islands, U.S.       123
## 133          GH                                   Ghana        123
## 134          ZM                                  Zambia        123
## 135          GI                               Gibraltar        123
## 136          BA                  Bosnia and Herzegovina        123
## 137          ZW                                Zimbabwe        123
## 138          LS                                 Lesotho        123
## 139          CY                                  Cyprus        123
## 140          YE                                   Yemen        123
## 141          HT                                   Haiti        123
## 142          SL                              Sierra Leone       123
## 143          VG                  Virgin Islands, British        123
## 144          PE                                    Peru        123
## 145          AM                                 Armenia        123
## 146          BY                                 Belarus        123
## 147          UZ                               Uzbekistan       123
## 148          UG                                  Uganda        123
## 149          VE          Venezuela, Bolivarian Republic of      123
##     X2015.Score X2014.Rank X2014.Score X2013.Rank X2013.Score
## 1            78         11          67         36          42
## 2            76          1          97          1          94
## 3            70          2          83          2          87
## 4            68         12          66         61           0
## 5            67          4          73          7          72
## 6            67          5          72          9          66
## 7            66         13          66         61           0
## 8            64          8          70          2          87
```

```
## 9           64         17         64          5         74
## 10          63          7         71          4         76
## 11          63          3         80         14         59
## 12          61         26         54         24         48
## 13          58         16         64         15         58
## 14          58         28         53         26         47
## 15          57         21         60         17         55
## 16          56         51         41         20         52
## 17          55         22         59         12         59
## 18          55         31         52         27         46
## 19          55         10         68         27         46
## 20          55         25         55         21         52
## 21          52         13         66         29         45
## 22          51         43         44         19         53
## 23          50         28         53         32         43
## 24          50         23         59         23         51
## 25          50         66         34         47         34
## 26          49          9         69         11         61
## 27          48         17         64         17         55
## 28          48         13         66          8         67
## 29          47         24         58         12         59
## 30          47         20         61         61          0
## 31          46         36         48         41         40
## 32          46         19         61         32         43
## 33          46         34         51         61          0
## 34          44         98          0         61          0
## 35          43         53         39         56         27
## 36          43         31         52         61          0
## 37          42         45         43         61          0
## 38          42         98          0         61          0
## 39          42         54         38         56         27
## 40          41         98          0         61          0
## 41          40         45         43         38         42
## 42          39         59         36         61          0
## 43          39         54         38         42         40
## 44          38         40         46         25         48
## 45          38         74         28         61          0
## 46          38         98          0         61          0
## 47          37         30         53         61          0
## 48          37         35         50         61          0
## 49          36         NA         NA         NA         NA
## 50          35         NA         NA         NA         NA
## 51          35         98          0         61          0
## 52          35         61         35         43         39
## 53          35         41         45         61          0
## 54          34         36         48         50         32
## 55          34         50         42         61          0
## 56          34         39         47         16         56
## 57          34         NA         NA         NA         NA
## 58          32         63         34         58         22
## 59          32         59         36         44         37
## 60          32         44         44         32         43
## 61          30         41         45         NA         NA
## 62          30         45         43         32         43
## 63          30         NA         NA         NA         NA
## 64          30         92         19         61          0
## 65          30         63         34         52         30
## 66          29         63         34         45         36
## 67          29         93         18         NA         NA
## 68          29         54         38         46         35
## 69          28         61         35         61          0
## 70          28         98          0         61          0
## 71          27         85         22         59         20
## 72          27         NA         NA         NA         NA
## 73          27         98          0         61          0
## 74          27         69         33         61          0
## 75          27         57         37         61          0
## 76          26         79         25         NA         NA
## 77          26         98          0         61          0
## 78          25         71         31         61          0
## 79          25         84         23         61          0
## 80          25         NA         NA         NA         NA
## 81          25         98          0         61          0
## 82          23         98          0         61          0
## 83          22         98          0         61          0
## 84          22         81         25         51         31
## 85          22         98          0         61          0
## 86          21         66         34         52         30
## 87          21         98          0         61          0
## 88          20         NA         NA         NA         NA
```

```
## 89          20         79          25         61          0
## 90          19         88          21         61          0
## 91          19         88          21         61          0
## 92          19         96          12         61          0
## 93          18         58          37         38         42
## 94          18         98           0         61          0
## 95          18         98           0         61          0
## 96          17         98           0         61          0
## 97          17         98           0         61          0
## 98          16         78          26         61          0
## 99          16         85          22         61          0
## 100         16         NA          NA         NA         NA
## 101         16         97          10         61          0
## 102         16         98           0         61          0
## 103         15         74          28         54         28
## 104         15         98           0         61          0
## 105         14         98           0         61          0
## 106         13         98           0         61          0
## 107         13         98           0         61          0
## 108         12         77          27         61          0
## 109         11         NA          NA         NA         NA
## 110         11         NA          NA         NA         NA
## 111         11         98           0         61          0
## 112         10         98           0         61          0
## 113          9         73          29         55         28
## 114          9         98           0         61          0
## 115          9         NA          NA         NA         NA
## 116          8         98           0         61          0
## 117          7         98           0         61          0
## 118          7         98           0         61          0
## 119          7         NA          NA         NA         NA
## 120          6         NA          NA         NA         NA
## 121          5         98           0         61          0
## 122          3         98           0         61          0
## 123          0          5          72          9         66
## 124          0         26          54          6         73
## 125          0         38          48         38         42
## 126          0         31          52         21         52
## 127          0         48          42         31         44
## 128          0         48          42         36         42
## 129          0         51          41         30         45
## 130          0         66          34         47         34
## 131          0         70          32         49         32
## 132          0         72          30         61          0
## 133          0         83          24         61          0
## 134          0         76          27         61          0
## 135          0         NA          NA         NA         NA
## 136          0         88          21         61          0
## 137          0         82          24         61          0
## 138          0         87          21         61          0
## 139          0         88          21         60          3
## 140          0         NA          NA         NA         NA
## 141          0         95          13         61          0
## 142          0         94          15         61          0
## 143          0         NA          NA         NA         NA
## 144          0         98           0         61          0
## 145          0         98           0         61          0
## 146          0         98           0         61          0
## 147          0         98           0         61          0
## 148          0         98           0         61          0
## 149          0         98           0         61          0
```

```
names(openData)
```

```
## [1] "Country.Code" "Country.Name" "X2015.Rank"   "X2015.Score"
## [5] "X2014.Rank"   "X2014.Score"  "X2013.Rank"   "X2013.Score"
```

```
attach(openData)
str(openData)
```

```
## 'data.frame':    149 obs. of  8 variables:
##  $ Country.Code: Factor w/ 149 levels "AE","AG","AL",..: 135 45 35 30 43 7 140 139 99 100 ...
##  $ Country.Name: Factor w/ 149 levels "Albania","Algeria",..: 127 140 36 31 43 7 142 141 93 97 ...
##  $ X2015.Rank  : int  1 2 3 4 5 5 7 8 8 10 ...
##  $ X2015.Score : int  78 76 70 68 67 67 66 64 64 63 ...
##  $ X2014.Rank  : int  11 1 2 12 4 5 13 8 17 7 ...
##  $ X2014.Score : int  67 97 83 66 73 72 66 70 64 71 ...
##  $ X2013.Rank  : int  36 1 2 61 7 9 61 2 5 4 ...
##  $ X2013.Score : int  42 94 87 0 72 66 0 87 74 76 ...
```

```
View(openData)
```

## Getting data from Happiness Rank Scores - Country Wise

## Year - 2015

```
setwd("D:/Big Data/Sasi Big Data")
happiness2015=read.csv("Happiness-Rank-Scores-Country-2015.csv",header=TRUE)
happiness2015
```

```
##                   Country                       Region
## 1             Switzerland                 Western Europe
## 2                 Iceland                 Western Europe
## 3                 Denmark                 Western Europe
## 4                  Norway                 Western Europe
## 5                  Canada                  North America
## 6                 Finland                 Western Europe
## 7             Netherlands                 Western Europe
## 8                  Sweden                 Western Europe
## 9             New Zealand       Australia and New Zealand
## 10              Australia       Australia and New Zealand
## 11                 Israel Middle East and Northern Africa
## 12             Costa Rica     Latin America and Caribbean
## 13                Austria                 Western Europe
## 14                 Mexico     Latin America and Caribbean
## 15          United States                  North America
## 16                 Brazil     Latin America and Caribbean
## 17             Luxembourg                 Western Europe
## 18                Ireland                 Western Europe
## 19                Belgium                 Western Europe
## 20 United Arab Emirates Middle East and Northern Africa
## 21         United Kingdom                 Western Europe
## 22                   Oman Middle East and Northern Africa
## 23              Venezuela     Latin America and Caribbean
## 24              Singapore               Southeastern Asia
## 25                 Panama     Latin America and Caribbean
## 26                Germany                 Western Europe
## 27                  Chile     Latin America and Caribbean
## 28                  Qatar Middle East and Northern Africa
## 29                 France                 Western Europe
## 30              Argentina     Latin America and Caribbean
## 31         Czech Republic      Central and Eastern Europe
## 32                Uruguay     Latin America and Caribbean
## 33               Colombia     Latin America and Caribbean
## 34               Thailand               Southeastern Asia
## 35           Saudi Arabia Middle East and Northern Africa
## 36                  Spain                 Western Europe
## 37                  Malta                 Western Europe
## 38                 Taiwan                   Eastern Asia
## 39                 Kuwait Middle East and Northern Africa
## 40               Suriname     Latin America and Caribbean
## 41  Trinidad and Tobago     Latin America and Caribbean
## 42            El Salvador     Latin America and Caribbean
## 43              Guatemala     Latin America and Caribbean
## 44             Uzbekistan      Central and Eastern Europe
## 45               Slovakia      Central and Eastern Europe
## 46                  Japan                   Eastern Asia
## 47            South Korea                   Eastern Asia
## 48                Ecuador     Latin America and Caribbean
## 49                Bahrain Middle East and Northern Africa
## 50                  Italy                 Western Europe
## 51                Bolivia     Latin America and Caribbean
## 52                Moldova      Central and Eastern Europe
## 53               Paraguay     Latin America and Caribbean
## 54             Kazakhstan      Central and Eastern Europe
## 55               Slovenia      Central and Eastern Europe
## 56              Lithuania      Central and Eastern Europe
## 57              Nicaragua     Latin America and Caribbean
## 58                   Peru     Latin America and Caribbean
## 59                Belarus      Central and Eastern Europe
## 60                 Poland      Central and Eastern Europe
## 61               Malaysia               Southeastern Asia
## 62                Croatia      Central and Eastern Europe
## 63                  Libya Middle East and Northern Africa
## 64                 Russia      Central and Eastern Europe
## 65                Jamaica     Latin America and Caribbean
## 66            North Cyprus                 Western Europe
## 67                 Cyprus                 Western Europe
## 68                Algeria Middle East and Northern Africa
## 69                 Kosovo      Central and Eastern Europe
## 70           Turkmenistan      Central and Eastern Europe
## 71              Mauritius              Sub-Saharan Africa
## 72              Hong Kong                   Eastern Asia
## 73                Estonia      Central and Eastern Europe
## 74              Indonesia               Southeastern Asia
## 75                Vietnam               Southeastern Asia
## 76                 Turkey Middle East and Northern Africa
## 77             Kyrgyzstan      Central and Eastern Europe
## 78                Nigeria              Sub-Saharan Africa
```

```
## 79                   Bhutan                  Southern Asia
## 80                Azerbaijan      Central and Eastern Europe
## 81                  Pakistan                  Southern Asia
## 82                    Jordan Middle East and Northern Africa
## 83                Montenegro      Central and Eastern Europe
## 84                     China                   Eastern Asia
## 85                    Zambia              Sub-Saharan Africa
## 86                   Romania      Central and Eastern Europe
## 87                    Serbia      Central and Eastern Europe
## 88                  Portugal                  Western Europe
## 89                    Latvia      Central and Eastern Europe
## 90               Philippines               Southeastern Asia
## 91         Somaliland region              Sub-Saharan Africa
## 92                   Morocco Middle East and Northern Africa
## 93                 Macedonia      Central and Eastern Europe
## 94                Mozambique              Sub-Saharan Africa
## 95                   Albania      Central and Eastern Europe
## 96    Bosnia and Herzegovina      Central and Eastern Europe
## 97                   Lesotho              Sub-Saharan Africa
## 98        Dominican Republic     Latin America and Caribbean
## 99                      Laos               Southeastern Asia
## 100                 Mongolia                   Eastern Asia
## 101               Swaziland              Sub-Saharan Africa
## 102                  Greece                  Western Europe
## 103                 Lebanon Middle East and Northern Africa
## 104                 Hungary      Central and Eastern Europe
## 105                Honduras     Latin America and Caribbean
## 106              Tajikistan      Central and Eastern Europe
## 107                 Tunisia Middle East and Northern Africa
## 108  Palestinian Territories Middle East and Northern Africa
## 109              Bangladesh                  Southern Asia
## 110                    Iran Middle East and Northern Africa
## 111                 Ukraine      Central and Eastern Europe
## 112                    Iraq Middle East and Northern Africa
## 113            South Africa              Sub-Saharan Africa
## 114                   Ghana              Sub-Saharan Africa
## 115                Zimbabwe              Sub-Saharan Africa
## 116                 Liberia              Sub-Saharan Africa
## 117                   India                   Southern Asia
## 118                   Sudan              Sub-Saharan Africa
## 119                   Haiti     Latin America and Caribbean
## 120         Congo (Kinshasa)              Sub-Saharan Africa
## 121                   Nepal                   Southern Asia
## 122                Ethiopia              Sub-Saharan Africa
## 123            Sierra Leone              Sub-Saharan Africa
## 124              Mauritania              Sub-Saharan Africa
## 125                   Kenya              Sub-Saharan Africa
## 126                Djibouti              Sub-Saharan Africa
## 127                 Armenia      Central and Eastern Europe
## 128                Botswana              Sub-Saharan Africa
## 129                 Myanmar               Southeastern Asia
## 130                 Georgia      Central and Eastern Europe
## 131                  Malawi              Sub-Saharan Africa
## 132               Sri Lanka                   Southern Asia
## 133                Cameroon              Sub-Saharan Africa
## 134                Bulgaria      Central and Eastern Europe
## 135                   Egypt Middle East and Northern Africa
## 136                   Yemen Middle East and Northern Africa
## 137                  Angola              Sub-Saharan Africa
## 138                    Mali              Sub-Saharan Africa
## 139     Congo (Brazzaville)              Sub-Saharan Africa
## 140                 Comoros              Sub-Saharan Africa
## 141                  Uganda              Sub-Saharan Africa
## 142                 Senegal              Sub-Saharan Africa
## 143                   Gabon              Sub-Saharan Africa
## 144                   Niger              Sub-Saharan Africa
## 145                Cambodia               Southeastern Asia
## 146                Tanzania              Sub-Saharan Africa
## 147              Madagascar              Sub-Saharan Africa
## 148 Central African Republic              Sub-Saharan Africa
## 149                    Chad              Sub-Saharan Africa
## 150                  Guinea              Sub-Saharan Africa
## 151             Ivory Coast              Sub-Saharan Africa
## 152            Burkina Faso              Sub-Saharan Africa
## 153             Afghanistan                   Southern Asia
## 154                  Rwanda              Sub-Saharan Africa
## 155                   Benin              Sub-Saharan Africa
## 156                   Syria Middle East and Northern Africa
## 157                 Burundi              Sub-Saharan Africa
## 158                    Togo              Sub-Saharan Africa
```

```
##     Happiness.Rank Happiness.Score Standard.Error Economy..GDP.per.Capita.
## 1                1           7.587        0.03411                 1.39651
## 2                2           7.561        0.04884                 1.30232
## 3                3           7.527        0.03328                 1.32548
## 4                4           7.522        0.03880                 1.45900
## 5                5           7.427        0.03553                 1.32629
## 6                6           7.406        0.03140                 1.29025
## 7                7           7.378        0.02799                 1.32944
## 8                8           7.364        0.03157                 1.33171
## 9                9           7.286        0.03371                 1.25018
## 10              10           7.284        0.04083                 1.33358
## 11              11           7.278        0.03470                 1.22857
## 12              12           7.226        0.04454                 0.95578
## 13              13           7.200        0.03751                 1.33723
## 14              14           7.187        0.04176                 1.02054
## 15              15           7.119        0.03839                 1.39451
## 16              16           6.983        0.04076                 0.98124
## 17              17           6.946        0.03499                 1.56391
## 18              18           6.940        0.03676                 1.33596
## 19              19           6.937        0.03595                 1.30782
## 20              20           6.901        0.03729                 1.42727
## 21              21           6.867        0.01866                 1.26637
## 22              22           6.853        0.05335                 1.36011
## 23              23           6.810        0.06476                 1.04424
## 24              24           6.798        0.03780                 1.52186
## 25              25           6.786        0.04910                 1.06353
## 26              26           6.750        0.01848                 1.32792
## 27              27           6.670        0.05800                 1.10715
## 28              28           6.611        0.06257                 1.69042
## 29              29           6.575        0.03512                 1.27778
## 30              30           6.574        0.04612                 1.05351
## 31              31           6.505        0.04168                 1.17898
## 32              32           6.485        0.04539                 1.06166
## 33              33           6.477        0.05051                 0.91861
## 34              34           6.455        0.03557                 0.96690
## 35              35           6.411        0.04633                 1.39541
## 36              36           6.329        0.03468                 1.23011
## 37              37           6.302        0.04206                 1.20740
## 38              38           6.298        0.03868                 1.29098
## 39              39           6.295        0.04456                 1.55422
## 40              40           6.269        0.09811                 0.99534
## 41              41           6.168        0.10895                 1.21183
## 42              42           6.130        0.05618                 0.76454
## 43              43           6.123        0.05224                 0.74553
## 44              44           6.003        0.04361                 0.63244
## 45              45           5.995        0.04267                 1.16891
## 46              46           5.987        0.03581                 1.27074
## 47              47           5.984        0.04098                 1.24461
## 48              48           5.975        0.04528                 0.86402
## 49              49           5.960        0.05412                 1.32376
## 50              50           5.948        0.03914                 1.25114
## 51              51           5.890        0.05642                 0.68133
## 52              52           5.889        0.03799                 0.59448
## 53              53           5.878        0.04563                 0.75985
## 54              54           5.855        0.04114                 1.12254
## 55              55           5.848        0.04251                 1.18498
## 56              56           5.833        0.03843                 1.14723
## 57              57           5.828        0.05371                 0.59325
## 58              58           5.824        0.04615                 0.90019
## 59              59           5.813        0.03938                 1.03192
## 60              60           5.791        0.04263                 1.12555
## 61              61           5.770        0.04330                 1.12486
## 62              62           5.759        0.04394                 1.08254
## 63              63           5.754        0.07832                 1.13145
## 64              64           5.716        0.03135                 1.13764
## 65              65           5.709        0.13693                 0.81038
## 66              66           5.695        0.05635                 1.20806
## 67              67           5.689        0.05580                 1.20813
## 68              68           5.605        0.05099                 0.93929
## 69              69           5.589        0.05018                 0.80148
## 70              70           5.548        0.04175                 0.95847
## 71              71           5.477        0.07197                 1.00761
## 72              72           5.474        0.05051                 1.38604
## 73              73           5.429        0.04013                 1.15174
## 74              74           5.399        0.02596                 0.82827
## 75              75           5.360        0.03107                 0.63216
## 76              76           5.332        0.03864                 1.06098
## 77              77           5.286        0.03823                 0.47428
## 78              78           5.268        0.04192                 0.65435
## 79              79           5.253        0.03225                 0.77042
```

```
## 80              80          5.212       0.03363                 1.02389
## 81              81          5.194       0.03726                 0.59543
## 82              82          5.192       0.04524                 0.90198
## 83              82          5.192       0.05235                 0.97438
## 84              84          5.140       0.02424                 0.89012
## 85              85          5.129       0.06988                 0.47038
## 86              86          5.124       0.06607                 1.04345
## 87              87          5.123       0.04864                 0.92053
## 88              88          5.102       0.04802                 1.15991
## 89              89          5.098       0.04640                 1.11312
## 90              90          5.073       0.04934                 0.70532
## 91              91          5.057       0.06161                 0.18847
## 92              92          5.013       0.03420                 0.73479
## 93              93          5.007       0.05376                 0.91851
## 94              94          4.971       0.07896                 0.08308
## 95              95          4.959       0.05013                 0.87867
## 96              96          4.949       0.06913                 0.83223
## 97              97          4.898       0.09438                 0.37545
## 98              98          4.885       0.07446                 0.89537
## 99              99          4.876       0.06698                 0.59066
## 100            100          4.874       0.03313                 0.82819
## 101            101          4.867       0.08742                 0.71206
## 102            102          4.857       0.05062                 1.15406
## 103            103          4.839       0.04337                 1.02564
## 104            104          4.800       0.06107                 1.12094
## 105            105          4.788       0.05648                 0.59532
## 106            106          4.786       0.03198                 0.39047
## 107            107          4.739       0.03589                 0.88113
## 108            108          4.715       0.04394                 0.59867
## 109            109          4.694       0.03077                 0.39753
## 110            110          4.686       0.04449                 1.00880
## 111            111          4.681       0.04412                 0.79907
## 112            112          4.677       0.05232                 0.98549
## 113            113          4.642       0.04585                 0.92049
## 114            114          4.633       0.04742                 0.54558
## 115            115          4.610       0.04290                 0.27100
## 116            116          4.571       0.11068                 0.07120
## 117            117          4.565       0.02043                 0.64499
## 118            118          4.550       0.06740                 0.52107
## 119            119          4.518       0.07331                 0.26673
## 120            120          4.517       0.03680                 0.00000
## 121            121          4.514       0.03607                 0.35997
## 122            122          4.512       0.03780                 0.19073
## 123            123          4.507       0.07068                 0.33024
## 124            124          4.436       0.03947                 0.45407
## 125            125          4.419       0.04734                 0.36471
## 126            126          4.369       0.08096                 0.44025
## 127            127          4.350       0.04763                 0.76821
## 128            128          4.332       0.04934                 0.99355
## 129            129          4.307       0.04351                 0.27108
## 130            130          4.297       0.04221                 0.74190
## 131            131          4.292       0.06130                 0.01604
## 132            132          4.271       0.03751                 0.83524
## 133            133          4.252       0.04678                 0.42250
## 134            134          4.218       0.04828                 1.01216
## 135            135          4.194       0.03260                 0.88180
## 136            136          4.077       0.04367                 0.54649
## 137            137          4.033       0.04758                 0.75778
## 138            138          3.995       0.05602                 0.26074
## 139            139          3.989       0.06682                 0.67866
## 140            140          3.956       0.04797                 0.23906
## 141            141          3.931       0.04317                 0.21102
## 142            142          3.904       0.03608                 0.36498
## 143            143          3.896       0.04547                 1.06024
## 144            144          3.845       0.03602                 0.06940
## 145            145          3.819       0.05069                 0.46038
## 146            146          3.781       0.05061                 0.28520
## 147            147          3.681       0.03633                 0.20824
## 148            148          3.678       0.06112                 0.07850
## 149            149          3.667       0.03830                 0.34193
## 150            150          3.656       0.03590                 0.17417
## 151            151          3.655       0.05141                 0.46534
## 152            152          3.587       0.04324                 0.25812
## 153            153          3.575       0.03084                 0.31982
## 154            154          3.465       0.03464                 0.22208
## 155            155          3.340       0.03656                 0.28665
## 156            156          3.006       0.05015                 0.66320
## 157            157          2.905       0.08658                 0.01530
## 158            158          2.839       0.06727                 0.20868
##      Family Health..Life.Expectancy. Freedom Trust..Government.Corruption.
```

```
## 1   1.34951                0.94143 0.66557                0.41978
## 2   1.40223                0.94784 0.62877                0.14145
## 3   1.36058                0.87464 0.64938                0.48357
## 4   1.33095                0.88521 0.66973                0.36503
## 5   1.32261                0.90563 0.63297                0.32957
## 6   1.31826                0.88911 0.64169                0.41372
## 7   1.28017                0.89284 0.61576                0.31814
## 8   1.28907                0.91087 0.65980                0.43844
## 9   1.31967                0.90837 0.63938                0.42922
## 10  1.30923                0.93156 0.65124                0.35637
## 11  1.22393                0.91387 0.41319                0.07785
## 12  1.23788                0.86027 0.63376                0.10583
## 13  1.29704                0.89042 0.62433                0.18676
## 14  0.91451                0.81444 0.48181                0.21312
## 15  1.24711                0.86179 0.54604                0.15890
## 16  1.23287                0.69702 0.49049                0.17521
## 17  1.21963                0.91894 0.61583                0.37798
## 18  1.36948                0.89533 0.61777                0.28703
## 19  1.28566                0.89667 0.58450                0.22540
## 20  1.12575                0.80925 0.64157                0.38583
## 21  1.28548                0.90943 0.59625                0.32067
## 22  1.08182                0.76276 0.63274                0.32524
## 23  1.25596                0.72052 0.42908                0.11069
## 24  1.02000                1.02525 0.54252                0.49210
## 25  1.19850                0.79661 0.54210                0.09270
## 26  1.29937                0.89186 0.61477                0.21843
## 27  1.12447                0.85857 0.44132                0.12869
## 28  1.07860                0.79733 0.64040                0.52208
## 29  1.26038                0.94579 0.55011                0.20646
## 30  1.24823                0.78723 0.44974                0.08484
## 31  1.20643                0.84483 0.46364                0.02652
## 32  1.20890                0.81160 0.60362                0.24558
## 33  1.24018                0.69077 0.53466                0.05120
## 34  1.26504                0.73850 0.55664                0.03187
## 35  1.08393                0.72025 0.31048                0.32524
## 36  1.31379                0.95562 0.45951                0.06398
## 37  1.30203                0.88721 0.60365                0.13586
## 38  1.07617                0.87530 0.39740                0.08129
## 39  1.16594                0.72492 0.55499                0.25609
## 40  0.97200                0.60820 0.59657                0.13633
## 41  1.18354                0.61483 0.55884                0.01140
## 42  1.02507                0.67737 0.40350                0.11776
## 43  1.04356                0.64425 0.57733                0.09472
## 44  1.34043                0.59772 0.65821                0.30826
## 45  1.26999                0.78902 0.31751                0.03431
## 46  1.25712                0.99111 0.49615                0.18060
## 47  0.95774                0.96538 0.33208                0.07857
## 48  0.99903                0.79075 0.48574                0.18090
## 49  1.21624                0.74716 0.45492                0.30600
## 50  1.19777                0.95446 0.26236                0.02901
## 51  0.97841                0.53920 0.57414                0.08800
## 52  1.01528                0.61826 0.32818                0.01615
## 53  1.30477                0.66098 0.53899                0.08242
## 54  1.12241                0.64368 0.51649                0.08454
## 55  1.27385                0.87337 0.60855                0.03787
## 56  1.25745                0.73128 0.21342                0.01031
## 57  1.14184                0.74314 0.55475                0.19317
## 58  0.97459                0.73017 0.41496                0.05989
## 59  1.23289                0.73608 0.37938                0.19090
## 60  1.27948                0.77903 0.53122                0.04212
## 61  1.07023                0.72394 0.53024                0.10501
## 62  0.79624                0.78805 0.25883                0.02430
## 63  1.11862                0.70380 0.41668                0.11023
## 64  1.23617                0.66926 0.36679                0.03005
## 65  1.15102                0.68741 0.50442                0.02299
## 66  1.07008                0.92356 0.49027                0.14280
## 67  0.89318                0.92356 0.40672                0.06146
## 68  1.07772                0.61766 0.28579                0.17383
## 69  0.81198                0.63132 0.24749                0.04741
## 70  1.22668                0.53886 0.47610                0.30844
## 71  0.98521                0.70950 0.56066                0.07521
## 72  1.05818                1.01328 0.59608                0.37124
## 73  1.22791                0.77361 0.44888                0.15184
## 74  1.08708                0.63793 0.46611                0.00000
## 75  0.91226                0.74676 0.59444                0.10441
## 76  0.94632                0.73172 0.22815                0.15746
## 77  1.15115                0.65088 0.43477                0.04232
## 78  0.90432                0.16007 0.34334                0.04030
## 79  1.10395                0.57407 0.53206                0.15445
## 80  0.93793                0.64045 0.37030                0.16065
```

```
## 81  0.41411                0.51466 0.12102                0.10464
## 82  1.05392                0.69639 0.40661                0.14293
## 83  0.90557                0.72521 0.18260                0.14296
## 84  0.94675                0.81658 0.51697                0.02781
## 85  0.91612                0.29924 0.48827                0.12468
## 86  0.88588                0.76890 0.35068                0.00649
## 87  1.00964                0.74836 0.20107                0.02617
## 88  1.13935                0.87519 0.51469                0.01078
## 89  1.09562                0.72437 0.29671                0.06332
## 90  1.03516                0.58114 0.62545                0.12279
## 91  0.95152                0.43873 0.46582                0.39928
## 92  0.64095                0.60954 0.41691                0.08546
## 93  1.00232                0.73545 0.33457                0.05327
## 94  1.02626                0.09131 0.34037                0.15603
## 95  0.80434                0.81325 0.35733                0.06413
## 96  0.91916                0.79081 0.09245                0.00227
## 97  1.04103                0.07612 0.31767                0.12504
## 98  1.17202                0.66825 0.57672                0.14234
## 99  0.73803                0.54909 0.59591                0.24249
## 100 1.30060                0.60268 0.43626                0.02666
## 101 1.07284                0.07566 0.30658                0.03060
## 102 0.92933                0.88213 0.07699                0.01397
## 103 0.80001                0.83947 0.33916                0.04582
## 104 1.20215                0.75905 0.32112                0.02758
## 105 0.95348                0.69510 0.40148                0.06825
## 106 0.85563                0.57379 0.47216                0.15072
## 107 0.60429                0.73793 0.26268                0.06358
## 108 0.92558                0.66015 0.24499                0.12905
## 109 0.43106                0.60164 0.40820                0.12569
## 110 0.54447                0.69805 0.30033                0.05863
## 111 1.20278                0.67390 0.25123                0.02961
## 112 0.81889                0.60237 0.00000                0.13788
## 113 1.18468                0.27688 0.33207                0.08884
## 114 0.67954                0.40132 0.42342                0.04355
## 115 1.03276                0.33475 0.25861                0.08079
## 116 0.78968                0.34201 0.28531                0.06232
## 117 0.38174                0.51529 0.39786                0.08492
## 118 1.01404                0.36878 0.10081                0.14660
## 119 0.74302                0.38847 0.24425                0.17175
## 120 1.00120                0.09806 0.22605                0.07625
## 121 0.86449                0.56874 0.38282                0.05907
## 122 0.60406                0.44055 0.43450                0.15048
## 123 0.95571                0.00000 0.40840                0.08786
## 124 0.86908                0.35874 0.24232                0.17461
## 125 0.99876                0.41435 0.42215                0.05839
## 126 0.59207                0.36291 0.46074                0.28105
## 127 0.77711                0.72990 0.19847                0.03900
## 128 1.10464                0.04776 0.49495                0.12474
## 129 0.70905                0.48246 0.44017                0.19034
## 130 0.38562                0.72926 0.40577                0.38331
## 131 0.41134                0.22562 0.43054                0.06977
## 132 1.01905                0.70806 0.53726                0.09179
## 133 0.88767                0.23402 0.49309                0.05786
## 134 1.10614                0.76649 0.30587                0.00872
## 135 0.74700                0.61712 0.17288                0.06324
## 136 0.68093                0.40064 0.35571                0.07854
## 137 0.86040                0.16683 0.10384                0.07122
## 138 1.03526                0.20583 0.38857                0.12352
## 139 0.66290                0.31051 0.41466                0.11686
## 140 0.79273                0.36315 0.22917                0.19900
## 141 1.13299                0.33861 0.45727                0.07267
## 142 0.97619                0.43540 0.36772                0.10713
## 143 0.90528                0.43372 0.31914                0.11091
## 144 0.77265                0.29707 0.47692                0.15639
## 145 0.62736                0.61114 0.66246                0.07247
## 146 1.00268                0.38215 0.32878                0.05747
## 147 0.66801                0.46721 0.19184                0.08124
## 148 0.00000                0.06699 0.48879                0.08289
## 149 0.76062                0.15010 0.23501                0.05269
## 150 0.46475                0.24009 0.37725                0.12139
## 151 0.77115                0.15185 0.46866                0.17922
## 152 0.85188                0.27125 0.39493                0.12832
## 153 0.30285                0.30335 0.23414                0.09719
## 154 0.77370                0.42864 0.59201                0.55191
## 155 0.35386                0.31910 0.48450                0.08010
## 156 0.47489                0.72193 0.15684                0.18906
## 157 0.41587                0.22396 0.11850                0.10062
## 158 0.13995                0.28443 0.36453                0.10731
##     Generosity Dystopia.Residual
## 1      0.29678           2.51738
```

```
## 2      0.43630          2.70201
## 3      0.34139          2.49204
## 4      0.34699          2.46531
## 5      0.45811          2.45176
## 6      0.23351          2.61955
## 7      0.47610          2.46570
## 8      0.36262          2.37119
## 9      0.47501          2.26425
## 10     0.43562          2.26646
## 11     0.33172          3.08854
## 12     0.25497          3.17728
## 13     0.33088          2.53320
## 14     0.14074          3.60214
## 15     0.40105          2.51011
## 16     0.14574          3.26001
## 17     0.28034          1.96961
## 18     0.45901          1.97570
## 19     0.22250          2.41484
## 20     0.26428          2.24743
## 21     0.51912          1.96994
## 22     0.21542          2.47489
## 23     0.05841          3.19131
## 24     0.31105          1.88501
## 25     0.24434          2.84848
## 26     0.28214          2.11569
## 27     0.33363          2.67585
## 28     0.32573          1.55674
## 29     0.12332          2.21126
## 30     0.11451          2.83600
## 31     0.10686          2.67782
## 32     0.23240          2.32142
## 33     0.18401          2.85737
## 34     0.57630          2.31945
## 35     0.13706          2.43872
## 36     0.18227          2.12367
## 37     0.51752          1.64880
## 38     0.25376          2.32323
## 39     0.16228          1.87634
## 40     0.16991          2.79094
## 41     0.31844          2.26882
## 42     0.10692          3.03500
## 43     0.27489          2.74255
## 44     0.22837          2.23741
## 45     0.16893          2.24639
## 46     0.10705          1.68435
## 47     0.18557          2.21978
## 48     0.11541          2.53942
## 49     0.17362          1.73797
## 50     0.22823          2.02518
## 51     0.20536          2.82334
## 52     0.20951          3.10712
## 53     0.34240          2.18896
## 54     0.11827          2.24729
## 55     0.25328          1.61583
## 56     0.02641          2.44649
## 57     0.27815          2.32407
## 58     0.14982          2.59450
## 59     0.11046          2.13090
## 60     0.16759          1.86565
## 61     0.33075          1.88541
## 62     0.05444          2.75414
## 63     0.18295          2.09066
## 64     0.00199          2.27394
## 65     0.21230          2.32038
## 66     0.26169          1.59888
## 67     0.30638          1.88931
## 68     0.07822          2.43209
## 69     0.28310          2.76579
## 70     0.16979          1.86984
## 71     0.37744          1.76145
## 72     0.39478          0.65429
## 73     0.08680          1.58782
## 74     0.51535          1.86399
## 75     0.16860          2.20173
## 76     0.12253          2.08528
## 77     0.30030          2.23270
## 78     0.27233          2.89319
## 79     0.47998          1.63794
## 80     0.07799          2.00073
## 81     0.33671          3.10709
```

```
## 82     0.11053           1.87996
## 83     0.16140           2.10017
## 84     0.08185           1.86040
## 85     0.19591           2.63430
## 86     0.13748           1.93129
## 87     0.19231           2.02500
## 88     0.13719           1.26462
## 89     0.18226           1.62215
## 90     0.24991           1.75360
## 91     0.50318           2.11032
## 92     0.07172           2.45373
## 93     0.22359           1.73933
## 94     0.22269           3.05137
## 95     0.14272           1.89894
## 96     0.24808           2.06367
## 97     0.16388           2.79832
## 98     0.21684           1.21305
## 99     0.42192           1.73799
## 100    0.33230           1.34759
## 101    0.18259           2.48676
## 102    0.00000           1.80101
## 103    0.21854           1.57059
## 104    0.12800           1.24074
## 105    0.23027           1.84408
## 106    0.22974           2.11399
## 107    0.06431           2.12466
## 108    0.11251           2.04384
## 109    0.21222           2.51767
## 110    0.38086           1.69440
## 111    0.15275           1.57140
## 112    0.17922           1.95335
## 113    0.11973           1.71956
## 114    0.23087           2.30919
## 115    0.18987           2.44191
## 116    0.24362           2.77729
## 117    0.26475           2.27513
## 118    0.19062           2.20857
## 119    0.46187           2.24173
## 120    0.24834           2.86712
## 121    0.32296           1.95637
## 122    0.24325           2.44876
## 123    0.21488           2.51009
## 124    0.21900           2.11773
## 125    0.37542           1.78555
## 126    0.18093           2.05125
## 127    0.07855           1.75873
## 128    0.10461           1.46181
## 129    0.79588           1.41805
## 130    0.05547           1.59541
## 131    0.33128           2.80791
## 132    0.40828           0.67108
## 133    0.20618           1.95071
## 134    0.11921           0.89991
## 135    0.11291           1.59927
## 136    0.09131           1.92313
## 137    0.12344           1.94939
## 138    0.18798           1.79293
## 139    0.12388           1.68135
## 140    0.17441           1.95812
## 141    0.29066           1.42766
## 142    0.20843           1.44395
## 143    0.06822           0.99895
## 144    0.19387           1.87877
## 145    0.40359           0.98195
## 146    0.34377           1.38079
## 147    0.21333           1.85100
## 148    0.23835           2.72230
## 149    0.18386           1.94296
## 150    0.28657           1.99172
## 151    0.20165           1.41723
## 152    0.21747           1.46494
## 153    0.36510           1.95210
## 154    0.22628           0.67042
## 155    0.18260           1.63328
## 156    0.47179           0.32858
## 157    0.19727           1.83302
## 158    0.16681           1.56726
```

```
names(happiness2015)
```

```
##  [1] "Country"                       "Region"
##  [3] "Happiness.Rank"                "Happiness.Score"
##  [5] "Standard.Error"                "Economy..GDP.per.Capita."
##  [7] "Family"                        "Health..Life.Expectancy."
##  [9] "Freedom"                       "Trust..Government.Corruption."
## [11] "Generosity"                    "Dystopia.Residual"
```

```
attach(happiness2015)
str(happiness2015)
```

```
## 'data.frame':    158 obs. of  12 variables:
##  $ Country                       : Factor w/ 158 levels "Afghanistan",..: 136 59 38 106 25 46 100 135 101 7 ...
##  $ Region                        : Factor w/ 10 levels "Australia and New Zealand",..: 10 10 10 10 6 10 10 10
1 1 ...
##  $ Happiness.Rank                : int  1 2 3 4 5 6 7 8 9 10 ...
##  $ Happiness.Score               : num  7.59 7.56 7.53 7.52 7.43 ...
##  $ Standard.Error                : num  0.0341 0.0488 0.0333 0.0388 0.0355 ...
##  $ Economy..GDP.per.Capita.      : num  1.4 1.3 1.33 1.46 1.33 ...
##  $ Family                        : num  1.35 1.4 1.36 1.33 1.32 ...
##  $ Health..Life.Expectancy.      : num  0.941 0.948 0.875 0.885 0.906 ...
##  $ Freedom                       : num  0.666 0.629 0.649 0.67 0.633 ...
##  $ Trust..Government.Corruption.: num  0.42 0.141 0.484 0.365 0.33 ...
##  $ Generosity                    : num  0.297 0.436 0.341 0.347 0.458 ...
##  $ Dystopia.Residual             : num  2.52 2.7 2.49 2.47 2.45 ...
```

```
View(happiness2015)
```

## Getting data from Happiness Rank Scores - Country Wise

## Year - 2016

```
setwd("D:/Big Data/Sasi Big Data")
happiness2016=read.csv("Happiness-Rank-Scores-Country-2016.csv",header=TRUE)
happiness2016
```

```
##                   Country                          Region Happiness.Rank
## 1                 Denmark                  Western Europe             1
## 2             Switzerland                  Western Europe             2
## 3                 Iceland                  Western Europe             3
## 4                  Norway                  Western Europe             4
## 5                 Finland                  Western Europe             5
## 6                  Canada                   North America             6
## 7             Netherlands                  Western Europe             7
## 8             New Zealand       Australia and New Zealand             8
## 9               Australia       Australia and New Zealand             9
## 10                Sweden                  Western Europe            10
## 11                Israel Middle East and Northern Africa            11
## 12               Austria                  Western Europe            12
## 13         United States                   North America            13
## 14            Costa Rica     Latin America and Caribbean            14
## 15           Puerto Rico     Latin America and Caribbean            15
## 16               Germany                  Western Europe            16
## 17                Brazil     Latin America and Caribbean            17
## 18               Belgium                  Western Europe            18
## 19               Ireland                  Western Europe            19
## 20            Luxembourg                  Western Europe            20
## 21                Mexico     Latin America and Caribbean            21
## 22             Singapore               Southeastern Asia            22
## 23        United Kingdom                  Western Europe            23
## 24                 Chile     Latin America and Caribbean            24
## 25                Panama     Latin America and Caribbean            25
## 26             Argentina     Latin America and Caribbean            26
## 27        Czech Republic      Central and Eastern Europe            27
## 28  United Arab Emirates Middle East and Northern Africa            28
## 29               Uruguay     Latin America and Caribbean            29
## 30                 Malta                  Western Europe            30
## 31              Colombia     Latin America and Caribbean            31
## 32                France                  Western Europe            32
## 33              Thailand               Southeastern Asia            33
## 34          Saudi Arabia Middle East and Northern Africa            34
## 35                Taiwan                    Eastern Asia            34
## 36                 Qatar Middle East and Northern Africa            36
## 37                 Spain                  Western Europe            37
## 38               Algeria Middle East and Northern Africa            38
## 39             Guatemala     Latin America and Caribbean            39
## 40              Suriname     Latin America and Caribbean            40
## 41                Kuwait Middle East and Northern Africa            41
## 42               Bahrain Middle East and Northern Africa            42
## 43   Trinidad and Tobago     Latin America and Caribbean            43
## 44             Venezuela     Latin America and Caribbean            44
## 45              Slovakia      Central and Eastern Europe            45
## 46           El Salvador     Latin America and Caribbean            46
## 47              Malaysia               Southeastern Asia            47
## 48             Nicaragua     Latin America and Caribbean            48
## 49             Uzbekistan      Central and Eastern Europe            49
## 50                  Italy                  Western Europe            50
## 51               Ecuador     Latin America and Caribbean            51
## 52                Belize     Latin America and Caribbean            52
## 53                 Japan                    Eastern Asia            53
## 54            Kazakhstan      Central and Eastern Europe            54
## 55               Moldova      Central and Eastern Europe            55
## 56                Russia      Central and Eastern Europe            56
## 57                Poland      Central and Eastern Europe            57
## 58           South Korea                    Eastern Asia            57
## 59               Bolivia     Latin America and Caribbean            59
## 60             Lithuania      Central and Eastern Europe            60
## 61               Belarus      Central and Eastern Europe            61
## 62          North Cyprus                  Western Europe            62
## 63              Slovenia      Central and Eastern Europe            63
## 64                  Peru     Latin America and Caribbean            64
## 65          Turkmenistan      Central and Eastern Europe            65
## 66             Mauritius             Sub-Saharan Africa            66
## 67                 Libya Middle East and Northern Africa            67
## 68                Latvia      Central and Eastern Europe            68
## 69                Cyprus                  Western Europe            69
## 70              Paraguay     Latin America and Caribbean            70
## 71               Romania      Central and Eastern Europe            71
## 72               Estonia      Central and Eastern Europe            72
## 73               Jamaica     Latin America and Caribbean            73
## 74               Croatia      Central and Eastern Europe            74
## 75             Hong Kong                    Eastern Asia            75
## 76               Somalia             Sub-Saharan Africa            76
## 77                Kosovo      Central and Eastern Europe            77
## 78                Turkey Middle East and Northern Africa            78
```

```
## 79                Indonesia                Southeastern Asia             79
## 80                   Jordan Middle East and Northern Africa             80
## 81                Azerbaijan      Central and Eastern Europe             81
## 82              Philippines                Southeastern Asia             82
## 83                    China                     Eastern Asia             83
## 84                   Bhutan                    Southern Asia             84
## 85                Kyrgyzstan      Central and Eastern Europe             85
## 86                   Serbia      Central and Eastern Europe             86
## 87   Bosnia and Herzegovina      Central and Eastern Europe             87
## 88                Montenegro      Central and Eastern Europe             88
## 89       Dominican Republic     Latin America and Caribbean             89
## 90                   Morocco Middle East and Northern Africa             90
## 91                   Hungary      Central and Eastern Europe             91
## 92                  Pakistan                    Southern Asia             92
## 93                   Lebanon Middle East and Northern Africa             93
## 94                  Portugal                   Western Europe             94
## 95                 Macedonia      Central and Eastern Europe             95
## 96                   Vietnam                Southeastern Asia             96
## 97        Somaliland Region              Sub-Saharan Africa             97
## 98                   Tunisia Middle East and Northern Africa             98
## 99                    Greece                   Western Europe             99
## 100               Tajikistan      Central and Eastern Europe            100
## 101                 Mongolia                     Eastern Asia            101
## 102                     Laos                Southeastern Asia            102
## 103                  Nigeria              Sub-Saharan Africa            103
## 104                 Honduras     Latin America and Caribbean            104
## 105                     Iran Middle East and Northern Africa            105
## 106                   Zambia              Sub-Saharan Africa            106
## 107                    Nepal                    Southern Asia            107
## 108 Palestinian Territories Middle East and Northern Africa            108
## 109                  Albania      Central and Eastern Europe            109
## 110               Bangladesh                    Southern Asia            110
## 111             Sierra Leone              Sub-Saharan Africa            111
## 112                     Iraq Middle East and Northern Africa            112
## 113                  Namibia              Sub-Saharan Africa            113
## 114                 Cameroon              Sub-Saharan Africa            114
## 115                 Ethiopia              Sub-Saharan Africa            115
## 116             South Africa              Sub-Saharan Africa            116
## 117                Sri Lanka                    Southern Asia            117
## 118                    India                    Southern Asia            118
## 119                  Myanmar                Southeastern Asia            119
## 120                    Egypt Middle East and Northern Africa            120
## 121                  Armenia      Central and Eastern Europe            121
## 122                    Kenya              Sub-Saharan Africa            122
## 123                  Ukraine      Central and Eastern Europe            123
## 124                    Ghana              Sub-Saharan Africa            124
## 125         Congo (Kinshasa)              Sub-Saharan Africa            125
## 126                  Georgia      Central and Eastern Europe            126
## 127      Congo (Brazzaville)              Sub-Saharan Africa            127
## 128                  Senegal              Sub-Saharan Africa            128
## 129                 Bulgaria      Central and Eastern Europe            129
## 130               Mauritania              Sub-Saharan Africa            130
## 131                 Zimbabwe              Sub-Saharan Africa            131
## 132                   Malawi              Sub-Saharan Africa            132
## 133                    Sudan              Sub-Saharan Africa            133
## 134                    Gabon              Sub-Saharan Africa            134
## 135                     Mali              Sub-Saharan Africa            135
## 136                    Haiti     Latin America and Caribbean            136
## 137                 Botswana              Sub-Saharan Africa            137
## 138                  Comoros              Sub-Saharan Africa            138
## 139              Ivory Coast              Sub-Saharan Africa            139
## 140                 Cambodia                Southeastern Asia            140
## 141                   Angola              Sub-Saharan Africa            141
## 142                    Niger              Sub-Saharan Africa            142
## 143              South Sudan              Sub-Saharan Africa            143
## 144                     Chad              Sub-Saharan Africa            144
## 145             Burkina Faso              Sub-Saharan Africa            145
## 146                   Uganda              Sub-Saharan Africa            145
## 147                    Yemen Middle East and Northern Africa            147
## 148               Madagascar              Sub-Saharan Africa            148
## 149                 Tanzania              Sub-Saharan Africa            149
## 150                  Liberia              Sub-Saharan Africa            150
## 151                   Guinea              Sub-Saharan Africa            151
## 152                   Rwanda              Sub-Saharan Africa            152
## 153                    Benin              Sub-Saharan Africa            153
## 154              Afghanistan                    Southern Asia            154
## 155                     Togo              Sub-Saharan Africa            155
## 156                    Syria Middle East and Northern Africa            156
## 157                  Burundi              Sub-Saharan Africa            157
##     Happiness.Score Lower.Confidence.Interval Upper.Confidence.Interval
```

```
## 1           7.526                7.460                7.592
## 2           7.509                7.428                7.590
## 3           7.501                7.333                7.669
## 4           7.498                7.421                7.575
## 5           7.413                7.351                7.475
## 6           7.404                7.335                7.473
## 7           7.339                7.284                7.394
## 8           7.334                7.264                7.404
## 9           7.313                7.241                7.385
## 10          7.291                7.227                7.355
## 11          7.267                7.199                7.335
## 12          7.119                7.045                7.193
## 13          7.104                7.020                7.188
## 14          7.087                6.999                7.175
## 15          7.039                6.794                7.284
## 16          6.994                6.930                7.058
## 17          6.952                6.875                7.029
## 18          6.929                6.861                6.997
## 19          6.907                6.836                6.978
## 20          6.871                6.804                6.938
## 21          6.778                6.680                6.876
## 22          6.739                6.674                6.804
## 23          6.725                6.647                6.803
## 24          6.705                6.615                6.795
## 25          6.701                6.601                6.801
## 26          6.650                6.560                6.740
## 27          6.596                6.515                6.677
## 28          6.573                6.494                6.652
## 29          6.545                6.456                6.634
## 30          6.488                6.409                6.567
## 31          6.481                6.384                6.578
## 32          6.478                6.397                6.559
## 33          6.474                6.396                6.552
## 34          6.379                6.287                6.471
## 35          6.379                6.305                6.453
## 36          6.375                6.178                6.572
## 37          6.361                6.288                6.434
## 38          6.355                6.227                6.483
## 39          6.324                6.213                6.435
## 40          6.269                6.073                6.465
## 41          6.239                6.154                6.324
## 42          6.218                6.128                6.308
## 43          6.168                5.950                6.386
## 44          6.084                5.973                6.195
## 45          6.078                5.996                6.160
## 46          6.068                5.967                6.169
## 47          6.005                5.921                6.089
## 48          5.992                5.877                6.107
## 49          5.987                5.896                6.078
## 50          5.977                5.898                6.056
## 51          5.976                5.880                6.072
## 52          5.956                5.710                6.202
## 53          5.921                5.850                5.992
## 54          5.919                5.837                6.001
## 55          5.897                5.823                5.971
## 56          5.856                5.789                5.923
## 57          5.835                5.749                5.921
## 58          5.835                5.747                5.923
## 59          5.822                5.740                5.904
## 60          5.813                5.734                5.892
## 61          5.802                5.723                5.881
## 62          5.771                5.670                5.872
## 63          5.768                5.683                5.853
## 64          5.743                5.647                5.839
## 65          5.658                5.580                5.736
## 66          5.648                5.507                5.789
## 67          5.615                5.406                5.824
## 68          5.560                5.486                5.634
## 69          5.546                5.442                5.650
## 70          5.538                5.453                5.623
## 71          5.528                5.427                5.629
## 72          5.517                5.437                5.597
## 73          5.510                5.315                5.705
## 74          5.488                5.402                5.574
## 75          5.458                5.362                5.554
## 76          5.440                5.321                5.559
## 77          5.401                5.308                5.494
## 78          5.389                5.295                5.483
## 79          5.314                5.237                5.391
## 80          5.303                5.187                5.419
```

```
## 81          5.291                   5.226                   5.356
## 82          5.279                   5.160                   5.398
## 83          5.245                   5.199                   5.291
## 84          5.196                   5.138                   5.254
## 85          5.185                   5.103                   5.267
## 86          5.177                   5.083                   5.271
## 87          5.163                   5.063                   5.263
## 88          5.161                   5.055                   5.267
## 89          5.155                   5.037                   5.273
## 90          5.151                   5.058                   5.244
## 91          5.145                   5.056                   5.234
## 92          5.132                   5.038                   5.226
## 93          5.129                   5.031                   5.227
## 94          5.123                   5.030                   5.216
## 95          5.121                   5.017                   5.225
## 96          5.061                   4.991                   5.131
## 97          5.057                   4.934                   5.180
## 98          5.045                   4.965                   5.125
## 99          5.033                   4.935                   5.131
## 100         4.996                   4.923                   5.069
## 101         4.907                   4.838                   4.976
## 102         4.876                   4.742                   5.010
## 103         4.875                   4.750                   5.000
## 104         4.871                   4.750                   4.992
## 105         4.813                   4.703                   4.923
## 106         4.795                   4.645                   4.945
## 107         4.793                   4.698                   4.888
## 108         4.754                   4.649                   4.859
## 109         4.655                   4.546                   4.764
## 110         4.643                   4.560                   4.726
## 111         4.635                   4.505                   4.765
## 112         4.575                   4.446                   4.704
## 113         4.574                   4.374                   4.774
## 114         4.513                   4.417                   4.609
## 115         4.508                   4.425                   4.591
## 116         4.459                   4.371                   4.547
## 117         4.415                   4.322                   4.508
## 118         4.404                   4.351                   4.457
## 119         4.395                   4.327                   4.463
## 120         4.362                   4.259                   4.465
## 121         4.360                   4.266                   4.454
## 122         4.356                   4.259                   4.453
## 123         4.324                   4.236                   4.412
## 124         4.276                   4.185                   4.367
## 125         4.272                   4.191                   4.353
## 126         4.252                   4.164                   4.340
## 127         4.236                   4.107                   4.365
## 128         4.219                   4.151                   4.287
## 129         4.217                   4.104                   4.330
## 130         4.201                   4.127                   4.275
## 131         4.193                   4.101                   4.285
## 132         4.156                   4.041                   4.271
## 133         4.139                   3.928                   4.350
## 134         4.121                   4.030                   4.212
## 135         4.073                   3.988                   4.158
## 136         4.028                   3.893                   4.163
## 137         3.974                   3.875                   4.073
## 138         3.956                   3.860                   4.052
## 139         3.916                   3.826                   4.006
## 140         3.907                   3.798                   4.016
## 141         3.866                   3.753                   3.979
## 142         3.856                   3.781                   3.931
## 143         3.832                   3.596                   4.068
## 144         3.763                   3.672                   3.854
## 145         3.739                   3.647                   3.831
## 146         3.739                   3.629                   3.849
## 147         3.724                   3.621                   3.827
## 148         3.695                   3.621                   3.769
## 149         3.666                   3.561                   3.771
## 150         3.622                   3.463                   3.781
## 151         3.607                   3.533                   3.681
## 152         3.515                   3.444                   3.586
## 153         3.484                   3.404                   3.564
## 154         3.360                   3.288                   3.432
## 155         3.303                   3.192                   3.414
## 156         3.069                   2.936                   3.202
## 157         2.905                   2.732                   3.078
##     Economy..GDP.per.Capita.  Family Health..Life.Expectancy. Freedom
## 1                    1.44178 1.16374                 0.79504 0.57941
## 2                    1.52733 1.14524                 0.86303 0.58557
```

```
## 3                1.42666 1.18326                0.86733 0.56624
## 4                1.57744 1.12690                0.79579 0.59609
## 5                1.40598 1.13464                0.81091 0.57104
## 6                1.44015 1.09610                0.82760 0.57370
## 7                1.46468 1.02912                0.81231 0.55211
## 8                1.36066 1.17278                0.83096 0.58147
## 9                1.44443 1.10476                0.85120 0.56837
## 10               1.45181 1.08764                0.83121 0.58218
## 11               1.33766 0.99537                0.84917 0.36432
## 12               1.45038 1.08383                0.80565 0.54355
## 13               1.50796 1.04782                0.77900 0.48163
## 14               1.06879 1.02152                0.76146 0.55225
## 15               1.35943 1.08113                0.77758 0.46823
## 16               1.44787 1.09774                0.81487 0.53466
## 17               1.08754 1.03938                0.61415 0.40425
## 18               1.42539 1.05249                0.81959 0.51354
## 19               1.48341 1.16157                0.81455 0.54008
## 20               1.69752 1.03999                0.84542 0.54870
## 21               1.11508 0.71460                0.71143 0.37709
## 22               1.64555 0.86758                0.94719 0.48770
## 23               1.40283 1.08672                0.80991 0.50036
## 24               1.21670 0.90587                0.81883 0.37789
## 25               1.18306 0.98912                0.70835 0.48927
## 26               1.15137 1.06612                0.69711 0.42284
## 27               1.30915 1.00793                0.76376 0.41418
## 28               1.57352 0.87114                0.72993 0.56215
## 29               1.18157 1.03143                0.72183 0.54388
## 30               1.30782 1.09879                0.80315 0.54994
## 31               1.03032 1.02169                0.59659 0.44735
## 32               1.39488 1.00508                0.83795 0.46562
## 33               1.08930 1.04477                0.64915 0.49553
## 34               1.48953 0.84829                0.59267 0.37904
## 35               1.39729 0.92624                0.79565 0.32377
## 36               1.82427 0.87964                0.71723 0.56679
## 37               1.34253 1.12945                0.87896 0.37545
## 38               1.05266 0.83309                0.61804 0.21006
## 39               0.83454 0.87119                0.54039 0.50379
## 40               1.09686 0.77866                0.50933 0.52234
## 41               1.61714 0.87758                0.63569 0.43166
## 42               1.44024 0.94397                0.65696 0.47375
## 43               1.32572 0.98569                0.52608 0.48453
## 44               1.13367 1.03302                0.61904 0.19847
## 45               1.27973 1.08268                0.70367 0.23391
## 46               0.87370 0.80975                0.59600 0.37269
## 47               1.25142 0.88025                0.62366 0.39031
## 48               0.69384 0.89521                0.65213 0.46582
## 49               0.73591 1.16810                0.50163 0.60848
## 50               1.35495 1.04167                0.85102 0.18827
## 51               0.97306 0.85974                0.68613 0.40270
## 52               0.87616 0.68655                0.45569 0.51231
## 53               1.38007 1.06054                0.91491 0.46761
## 54               1.22943 0.95544                0.57386 0.40520
## 55               0.69177 0.83132                0.52309 0.25202
## 56               1.23228 1.05261                0.58991 0.32682
## 57               1.24585 1.04685                0.69058 0.45190
## 58               1.35948 0.72194                0.88645 0.25168
## 59               0.79422 0.83779                0.46970 0.50961
## 60               1.26920 1.06411                0.64674 0.18929
## 61               1.13062 1.04993                0.63104 0.29091
## 62               1.31141 0.81826                0.84142 0.43596
## 63               1.29947 1.05613                0.79151 0.53164
## 64               0.99602 0.81255                0.62994 0.37502
## 65               1.08017 1.03817                0.44006 0.37408
## 66               1.14372 0.75695                0.66189 0.46145
## 67               1.06688 0.95076                0.52304 0.40672
## 68               1.21788 0.95025                0.63952 0.27996
## 69               1.31857 0.70697                0.84880 0.29507
## 70               0.89373 1.11111                0.58295 0.46235
## 71               1.16970 0.72803                0.67602 0.36712
## 72               1.27964 1.05163                0.68098 0.41511
## 73               0.89333 0.96372                0.59469 0.43597
## 74               1.18649 0.60809                0.70524 0.23907
## 75               1.51070 0.87021                0.95277 0.48079
## 76               0.00000 0.33613                0.11466 0.56778
## 77               0.90145 0.66062                0.54000 0.14396
## 78               1.16492 0.87717                0.64718 0.23889
## 79               0.95104 0.87625                0.49374 0.39237
## 80               0.99673 0.86216                0.60712 0.36023
## 81               1.12373 0.76042                0.54504 0.35327
## 82               0.81217 0.87877                0.47036 0.54854
```

```
## 83                  1.02780 0.79381                  0.73561 0.44012
## 84                  0.85270 0.90836                  0.49759 0.46074
## 85                  0.56044 0.95434                  0.55449 0.40212
## 86                  1.03437 0.81329                  0.64580 0.15718
## 87                  0.93383 0.64367                  0.70766 0.09511
## 88                  1.07838 0.74173                  0.63533 0.15111
## 89                  1.02787 0.99496                  0.57669 0.52259
## 90                  0.84058 0.38595                  0.59471 0.25646
## 91                  1.24142 0.93164                  0.67608 0.19770
## 92                  0.68816 0.26135                  0.40306 0.14622
## 93                  1.12268 0.64184                  0.76171 0.26228
## 94                  1.27607 0.94367                  0.79363 0.44727
## 95                  1.01930 0.78236                  0.64738 0.27668
## 96                  0.74037 0.79117                  0.66157 0.55954
## 97                  0.25558 0.75862                  0.33108 0.39130
## 98                  0.97724 0.43165                  0.59577 0.23553
## 99                  1.24886 0.75473                  0.80029 0.05822
## 100                 0.48835 0.75602                  0.53119 0.43408
## 101                 0.98853 1.08983                  0.55469 0.35972
## 102                 0.68042 0.54970                  0.38291 0.52168
## 103                 0.75216 0.64498                  0.05108 0.27854
## 104                 0.69429 0.75596                  0.58383 0.26755
## 105                 1.11758 0.38857                  0.64232 0.22544
## 106                 0.61202 0.63760                  0.23573 0.42662
## 107                 0.44626 0.69699                  0.50073 0.37012
## 108                 0.67024 0.71629                  0.56844 0.17744
## 109                 0.95530 0.50163                  0.73007 0.31866
## 110                 0.54177 0.24749                  0.52989 0.39778
## 111                 0.36485 0.62800                  0.00000 0.30685
## 112                 1.07474 0.59205                  0.51076 0.24856
## 113                 0.93287 0.70362                  0.34745 0.48614
## 114                 0.52497 0.62542                  0.12698 0.42736
## 115                 0.29283 0.37932                  0.34578 0.36703
## 116                 1.02416 0.96053                  0.18611 0.42483
## 117                 0.97318 0.84783                  0.62007 0.50817
## 118                 0.74036 0.29247                  0.45091 0.40285
## 119                 0.34112 0.69981                  0.39880 0.42692
## 120                 0.95395 0.49813                  0.52116 0.18847
## 121                 0.86086 0.62477                  0.64083 0.14037
## 122                 0.52267 0.76240                  0.30147 0.40576
## 123                 0.87287 1.01413                  0.58628 0.12859
## 124                 0.63107 0.49353                  0.29681 0.40973
## 125                 0.05661 0.80676                  0.18800 0.15602
## 126                 0.83792 0.19249                  0.64035 0.32461
## 127                 0.77109 0.47799                  0.28212 0.37938
## 128                 0.44314 0.77416                  0.40457 0.31056
## 129                 1.11306 0.92542                  0.67806 0.21219
## 130                 0.61391 0.84142                  0.28639 0.12680
## 131                 0.35041 0.71478                  0.15950 0.25429
## 132                 0.08709 0.14700                  0.29364 0.41430
## 133                 0.63069 0.81928                  0.29759 0.00000
## 134                 1.15851 0.72368                  0.34940 0.28098
## 135                 0.31292 0.86333                  0.16347 0.27544
## 136                 0.34097 0.29561                  0.27494 0.12072
## 137                 1.09426 0.89186                  0.34752 0.44089
## 138                 0.27509 0.60323                  0.29981 0.15412
## 139                 0.55507 0.57576                  0.04476 0.40663
## 140                 0.55604 0.53750                  0.42494 0.58852
## 141                 0.84731 0.66366                  0.04991 0.00589
## 142                 0.13270 0.60530                  0.26162 0.38041
## 143                 0.39394 0.18519                  0.15781 0.19662
## 144                 0.42214 0.63178                  0.03824 0.12807
## 145                 0.31995 0.63054                  0.21297 0.33370
## 146                 0.34719 0.90981                  0.19625 0.43653
## 147                 0.57939 0.47493                  0.31048 0.22870
## 148                 0.27954 0.46115                  0.37109 0.13684
## 149                 0.47155 0.77623                  0.35700 0.31760
## 150                 0.10706 0.50353                  0.23165 0.25748
## 151                 0.22415 0.31090                  0.18829 0.30953
## 152                 0.32846 0.61586                  0.31865 0.54320
## 153                 0.39499 0.10419                  0.21028 0.39747
## 154                 0.38227 0.11037                  0.17344 0.16430
## 155                 0.28123 0.00000                  0.24811 0.34678
## 156                 0.74719 0.14866                  0.62994 0.06912
## 157                 0.06831 0.23442                  0.15747 0.04320
##     Trust..Government.Corruption. Generosity Dystopia.Residual
## 1                         0.44453    0.36171           2.73939
## 2                         0.41203    0.28083           2.69463
## 3                         0.14975    0.47678           2.83137
## 4                         0.35776    0.37895           2.66465
```

```
## 5                    0.41004    0.25492          2.82596
## 6                    0.31329    0.44834          2.70485
## 7                    0.29927    0.47416          2.70749
## 8                    0.41904    0.49401          2.47553
## 9                    0.32331    0.47407          2.54650
## 10                   0.40867    0.38254          2.54734
## 11                   0.08728    0.32288          3.31029
## 12                   0.21348    0.32865          2.69343
## 13                   0.14868    0.41077          2.72782
## 14                   0.10547    0.22553          3.35168
## 15                   0.12275    0.22202          3.00760
## 16                   0.28551    0.30452          2.50931
## 17                   0.14166    0.15776          3.50733
## 18                   0.26248    0.24240          2.61355
## 19                   0.29754    0.44963          2.15988
## 20                   0.35329    0.27571          2.11055
## 21                   0.18355    0.11735          3.55906
## 22                   0.46987    0.32706          1.99375
## 23                   0.27399    0.50156          2.14999
## 24                   0.11451    0.31595          2.95505
## 25                   0.08423    0.24180          3.00559
## 26                   0.07296    0.10989          3.12985
## 27                   0.03986    0.09929          2.96211
## 28                   0.35561    0.26591          2.21507
## 29                   0.21394    0.18056          2.67139
## 30                   0.17554    0.56237          1.99032
## 31                   0.05399    0.15626          3.17471
## 32                   0.17808    0.12160          2.47440
## 33                   0.02833    0.58696          2.57960
## 34                   0.30008    0.15457          2.61482
## 35                   0.06630    0.25495          2.61523
## 36                   0.48049    0.32388          1.58224
## 37                   0.06137    0.17665          2.39663
## 38                   0.16157    0.07044          3.40904
## 39                   0.08701    0.28808          3.19863
## 40                   0.12692    0.16665          3.06852
## 41                   0.23669    0.15965          2.28085
## 42                   0.25772    0.17147          2.27405
## 43                   0.01241    0.31935          2.51394
## 44                   0.08304    0.04250          2.97468
## 45                   0.02947    0.13837          2.61065
## 46                   0.10613    0.08877          3.22134
## 47                   0.09081    0.41474          2.35384
## 48                   0.16292    0.29773          2.82428
## 49                   0.28333    0.34326          2.34638
## 50                   0.02556    0.16684          2.34918
## 51                   0.18037    0.10074          2.77366
## 52                   0.10771    0.23684          3.08039
## 53                   0.18985    0.10224          1.80584
## 54                   0.11132    0.15011          2.49325
## 55                   0.01903    0.19997          3.38007
## 56                   0.03586    0.02736          2.59115
## 57                   0.05500    0.14443          2.20035
## 58                   0.07716    0.18824          2.35015
## 59                   0.07746    0.21698          2.91635
## 60                   0.01820    0.02025          2.60525
## 61                   0.17457    0.13942          2.38582
## 62                   0.16578    0.26322          1.93447
## 63                   0.03635    0.25738          1.79522
## 64                   0.05292    0.14527          2.73117
## 65                   0.28467    0.22567          2.21489
## 66                   0.05203    0.36951          2.20223
## 67                   0.10339    0.17087          2.39374
## 68                   0.08890    0.17445          2.20859
## 69                   0.05228    0.27906          2.04497
## 70                   0.07396    0.25296          2.16091
## 71                   0.00679    0.12889          2.45184
## 72                   0.18519    0.08423          1.81985
## 73                   0.04294    0.22245          2.35682
## 74                   0.04002    0.18434          2.52462
## 75                   0.31647    0.40097          0.92614
## 76                   0.31180    0.27225          3.83772
## 77                   0.06547    0.27992          2.80998
## 78                   0.12348    0.04707          2.29074
## 79                   0.00322    0.56521          2.03171
## 80                   0.13297    0.14262          2.20142
## 81                   0.17914    0.05640          2.27350
## 82                   0.11757    0.21674          2.23484
## 83                   0.02745    0.04959          2.17087
## 84                   0.16160    0.48546          1.82916
```

```
## 85                      0.04762    0.38432          2.28136
## 86                      0.04339    0.20737          2.27539
## 87                      0.00000    0.29889          2.48406
## 88                      0.12721    0.17191          2.25531
## 89                      0.12372    0.21286          1.69626
## 90                      0.08404    0.04053          2.94891
## 91                      0.04472    0.09900          1.95473
## 92                      0.13880    0.31185          3.18286
## 93                      0.03061    0.23693          2.07339
## 94                      0.01521    0.11691          1.53015
## 95                      0.07047    0.23507          2.08947
## 96                      0.11556    0.25075          1.94180
## 97                      0.36794    0.51479          2.43801
## 98                      0.08170    0.03936          2.68413
## 99                      0.04127    0.00000          2.12944
## 100                     0.13509    0.25998          2.39106
## 101                     0.03285    0.34539          1.53586
## 102                     0.22423    0.43079          2.08637
## 103                     0.03050    0.23219          2.88586
## 104                     0.06906    0.20440          2.29551
## 105                     0.05570    0.38538          1.99817
## 106                     0.11479    0.17866          2.58991
## 107                     0.07008    0.38160          2.32694
## 108                     0.10613    0.11154          2.40364
## 109                     0.05301    0.16840          1.92816
## 110                     0.12583    0.19132          2.60904
## 111                     0.08196    0.23897          3.01402
## 112                     0.13636    0.19589          1.81657
## 113                     0.10398    0.07795          1.92198
## 114                     0.06126    0.22680          2.51980
## 115                     0.17170    0.29522          2.65614
## 116                     0.08415    0.13656          1.64227
## 117                     0.07964    0.46978          0.91681
## 118                     0.08722    0.25028          2.18032
## 119                     0.20243    0.81971          1.50655
## 120                     0.10393    0.12706          1.96895
## 121                     0.03616    0.07793          1.97864
## 122                     0.06686    0.41328          1.88326
## 123                     0.01829    0.20363          1.50066
## 124                     0.03260    0.21203          2.20020
## 125                     0.06075    0.25458          2.74924
## 126                     0.31880    0.06786          1.87031
## 127                     0.09753    0.12077          2.10681
## 128                     0.11681    0.19103          1.97861
## 129                     0.00615    0.12793          1.15377
## 130                     0.17955    0.22686          1.92630
## 131                     0.08582    0.18503          2.44270
## 132                     0.07564    0.30968          2.82859
## 133                     0.10039    0.18077          2.10995
## 134                     0.09314    0.06244          1.45332
## 135                     0.13647    0.21064          2.11087
## 136                     0.14476    0.47958          2.37116
## 137                     0.10769    0.12425          0.96741
## 138                     0.18437    0.18270          2.25632
## 139                     0.15530    0.20338          1.97478
## 140                     0.08092    0.40339          1.31573
## 141                     0.08434    0.12071          2.09459
## 142                     0.17176    0.20970          2.09469
## 143                     0.13015    0.25899          2.50929
## 144                     0.04952    0.18667          2.30637
## 145                     0.12533    0.24353          1.87319
## 146                     0.06442    0.27102          1.51416
## 147                     0.05892    0.09821          1.97295
## 148                     0.07506    0.22040          2.15075
## 149                     0.05099    0.31472          1.37769
## 150                     0.04852    0.24063          2.23284
## 151                     0.11920    0.29914          2.15604
## 152                     0.50521    0.23552          0.96819
## 153                     0.06681    0.20180          2.10812
## 154                     0.07112    0.31268          2.14558
## 155                     0.11587    0.17517          2.13540
## 156                     0.17233    0.48397          0.81789
## 157                     0.09419    0.20290          2.10404
```

```
names(happiness2016)
```

```
##  [1] "Country"                       "Region"
##  [3] "Happiness.Rank"                "Happiness.Score"
##  [5] "Lower.Confidence.Interval"     "Upper.Confidence.Interval"
##  [7] "Economy..GDP.per.Capita."      "Family"
##  [9] "Health..Life.Expectancy."      "Freedom"
## [11] "Trust..Government.Corruption." "Generosity"
## [13] "Dystopia.Residual"
```

```
attach(happiness2016)
```

```
## The following objects are masked from happiness2015:
##
##     Country, Dystopia.Residual, Economy..GDP.per.Capita., Family,
##     Freedom, Generosity, Happiness.Rank, Happiness.Score,
##     Health..Life.Expectancy., Region,
##     Trust..Government.Corruption.
```

```
str(happiness2016)
```

```
## 'data.frame':    157 obs. of  13 variables:
##  $ Country                       : Factor w/ 157 levels "Afghanistan",..: 38 135 58 104 45 26 98 99 7 134 ...
##  $ Region                        : Factor w/ 10 levels "Australia and New Zealand",..: 10 10 10 10 10 6 10 1 1
10 ...
##  $ Happiness.Rank                : int  1 2 3 4 5 6 7 8 9 10 ...
##  $ Happiness.Score               : num  7.53 7.51 7.5 7.5 7.41 ...
##  $ Lower.Confidence.Interval     : num  7.46 7.43 7.33 7.42 7.35 ...
##  $ Upper.Confidence.Interval     : num  7.59 7.59 7.67 7.58 7.47 ...
##  $ Economy..GDP.per.Capita.      : num  1.44 1.53 1.43 1.58 1.41 ...
##  $ Family                        : num  1.16 1.15 1.18 1.13 1.13 ...
##  $ Health..Life.Expectancy.      : num  0.795 0.863 0.867 0.796 0.811 ...
##  $ Freedom                       : num  0.579 0.586 0.566 0.596 0.571 ...
##  $ Trust..Government.Corruption.: num  0.445 0.412 0.15 0.358 0.41 ...
##  $ Generosity                    : num  0.362 0.281 0.477 0.379 0.255 ...
##  $ Dystopia.Residual             : num  2.74 2.69 2.83 2.66 2.83 ...
```

```
View(happiness2016)
```

## Getting data from Happiness Rank Scores - Country Wise

## Year - 2017

```
setwd("D:/Big Data/Sasi Big Data")
happiness2017=read.csv("Happiness-Rank-Scores-Country-2017.csv",header=TRUE)
happiness2017
```

```
##                    Country Happiness.Rank Happiness.Score Whisker.high
## 1                   Norway              1           7.537     7.594445
## 2                  Denmark              2           7.522     7.581728
## 3                  Iceland              3           7.504     7.622030
## 4              Switzerland              4           7.494     7.561772
## 5                  Finland              5           7.469     7.527542
## 6              Netherlands              6           7.377     7.427426
## 7                   Canada              7           7.316     7.384403
## 8              New Zealand              8           7.314     7.379510
## 9                   Sweden              9           7.284     7.344095
## 10               Australia             10           7.284     7.356651
## 11                  Israel             11           7.213     7.279853
## 12              Costa Rica             12           7.079     7.168112
## 13                 Austria             13           7.006     7.070670
## 14           United States             14           6.993     7.074657
## 15                 Ireland             15           6.977     7.043352
## 16                 Germany             16           6.951     7.005382
## 17                 Belgium             17           6.891     6.955821
## 18              Luxembourg             18           6.863     6.923686
## 19          United Kingdom             19           6.714     6.783792
## 20                   Chile             20           6.652     6.739251
## 21    United Arab Emirates             21           6.648     6.722047
## 22                  Brazil             22           6.635     6.725470
## 23          Czech Republic             23           6.609     6.683862
## 24               Argentina             24           6.599     6.690085
## 25                  Mexico             25           6.578     6.671149
## 26               Singapore             26           6.572     6.636723
## 27                   Malta             27           6.527     6.598397
## 28                 Uruguay             28           6.454     6.545906
## 29               Guatemala             29           6.454     6.566874
## 30                  Panama             30           6.452     6.557131
## 31                  France             31           6.442     6.515768
## 32                Thailand             32           6.424     6.509117
## 33 Taiwan Province of China             33           6.422     6.494596
## 34                   Spain             34           6.403     6.471055
## 35                   Qatar             35           6.375     6.568477
## 36                Colombia             36           6.357     6.452020
## 37            Saudi Arabia             37           6.344     6.444167
## 38     Trinidad and Tobago             38           6.168     6.381534
## 39                  Kuwait             39           6.105     6.191957
## 40                Slovakia             40           6.098     6.177348
## 41                 Bahrain             41           6.087     6.178989
## 42                Malaysia             42           6.084     6.179980
## 43               Nicaragua             43           6.071     6.186584
## 44                 Ecuador             44           6.008     6.105848
## 45             El Salvador             45           6.003     6.108635
## 46                  Poland             46           5.973     6.053908
## 47               Uzbekistan             47           5.971     6.065538
## 48                   Italy             48           5.964     6.042737
## 49                  Russia             49           5.963     6.030275
## 50                  Belize             50           5.956     6.197242
## 51                   Japan             51           5.920     5.990719
## 52               Lithuania             52           5.902     5.982670
## 53                 Algeria             53           5.872     5.978286
## 54                  Latvia             54           5.850     5.920264
## 55             South Korea             55           5.838     5.922559
## 56                 Moldova             56           5.838     5.908371
## 57                 Romania             57           5.825     5.919694
## 58                 Bolivia             58           5.823     5.903977
## 59            Turkmenistan             59           5.822     5.885181
## 60              Kazakhstan             60           5.819     5.903642
## 61            North Cyprus             61           5.810     5.897366
## 62                Slovenia             62           5.758     5.842225
## 63                    Peru             63           5.715     5.811947
## 64               Mauritius             64           5.629     5.729862
## 65                  Cyprus             65           5.621     5.714693
## 66                 Estonia             66           5.611     5.688140
## 67                 Belarus             67           5.569     5.646114
## 68                   Libya             68           5.525     5.676954
## 69                  Turkey             69           5.500     5.594865
## 70                Paraguay             70           5.493     5.577381
## 71  Hong Kong S.A.R., China             71           5.472     5.549594
## 72             Philippines             72           5.430     5.545335
## 73                  Serbia             73           5.395     5.491570
## 74                  Jordan             74           5.336     5.448410
## 75                 Hungary             75           5.324     5.403040
## 76                 Jamaica             76           5.311     5.581399
## 77                 Croatia             77           5.293     5.391777
## 78                  Kosovo             78           5.279     5.364848
```

```
## 79                    China            79          5.273     5.319278
## 80                 Pakistan            80          5.269     5.359984
## 81                Indonesia            81          5.262     5.352889
## 82                Venezuela            82          5.250     5.370032
## 83               Montenegro            83          5.237     5.341044
## 84                  Morocco            84          5.235     5.318341
## 85               Azerbaijan            85          5.234     5.299287
## 86       Dominican Republic            86          5.230     5.349061
## 87                   Greece            87          5.227     5.325246
## 88                  Lebanon            88          5.225     5.318882
## 89                 Portugal            89          5.195     5.285042
## 90   Bosnia and Herzegovina            90          5.182     5.276336
## 91                 Honduras            91          5.181     5.301583
## 92                Macedonia            92          5.175     5.272173
## 93                  Somalia            93          5.151     5.242484
## 94                  Vietnam            94          5.074     5.147281
## 95                  Nigeria            95          5.074     5.209500
## 96               Tajikistan            96          5.041     5.111426
## 97                   Bhutan            97          5.011     5.079335
## 98                Kyrgyzstan            98          5.004     5.089920
## 99                    Nepal            99          4.962     5.067356
## 100                Mongolia           100          4.955     5.021680
## 101           South Africa            101          4.829     4.929435
## 102                Tunisia            102          4.805     4.884367
## 103 Palestinian Territories           103          4.775     4.881848
## 104                  Egypt            104          4.735     4.825134
## 105                Bulgaria           105          4.714     4.803695
## 106           Sierra Leone            106          4.709     4.850643
## 107                Cameroon           107          4.695     4.796541
## 108                    Iran           108          4.692     4.798225
## 109                 Albania           109          4.644     4.752464
## 110              Bangladesh            110          4.608     4.689822
## 111                 Namibia           111          4.574     4.770355
## 112                   Kenya           112          4.553     4.655692
## 113              Mozambique            113          4.550     4.774102
## 114                 Myanmar           114          4.545     4.614740
## 115                 Senegal           115          4.535     4.601604
## 116                  Zambia           116          4.514     4.644106
## 117                    Iraq           117          4.497     4.622591
## 118                   Gabon           118          4.465     4.557362
## 119                Ethiopia           119          4.460     4.542729
## 120               Sri Lanka           120          4.440     4.553447
## 121                 Armenia           121          4.376     4.466735
## 122                   India           122          4.315     4.371522
## 123              Mauritania            123          4.292     4.377164
## 124     Congo (Brazzaville)            124          4.291     4.410054
## 125                 Georgia           125          4.286     4.374934
## 126        Congo (Kinshasa)            126          4.280     4.357811
## 127                    Mali           127          4.190     4.269671
## 128             Ivory Coast            128          4.180     4.275183
## 129                Cambodia           129          4.168     4.278518
## 130                   Sudan           130          4.139     4.345747
## 131                   Ghana           131          4.120     4.222707
## 132                 Ukraine           132          4.096     4.185410
## 133                  Uganda           133          4.081     4.195800
## 134            Burkina Faso            134          4.032     4.124059
## 135                   Niger           135          4.028     4.111947
## 136                  Malawi           136          3.970     4.077479
## 137                    Chad           137          3.936     4.034712
## 138                Zimbabwe           138          3.875     3.978700
## 139                 Lesotho           139          3.808     4.044344
## 140                  Angola           140          3.795     3.951642
## 141             Afghanistan            141          3.794     3.873661
## 142                Botswana           142          3.766     3.874123
## 143                   Benin           143          3.657     3.745784
## 144              Madagascar            144          3.644     3.714319
## 145                   Haiti           145          3.603     3.734715
## 146                   Yemen           146          3.593     3.692750
## 147             South Sudan            147          3.591     3.725539
## 148                 Liberia           148          3.533     3.653756
## 149                  Guinea           149          3.507     3.584428
## 150                    Togo           150          3.495     3.594038
## 151                  Rwanda           151          3.471     3.543030
## 152                   Syria           152          3.462     3.663669
## 153                Tanzania           153          3.349     3.461430
## 154                 Burundi           154          2.905     3.074690
## 155 Central African Republic           155          2.693     2.864884
##     Whisker.low Economy..GDP.per.Capita.    Family
## 1      7.479556              1.61646318 1.5335236
## 2      7.462272              1.48238301 1.5511216
```

```
## 3      7.385970             1.48063302 1.6105740
## 4      7.426227             1.56497955 1.5169117
## 5      7.410458             1.44357193 1.5402467
## 6      7.326574             1.50394464 1.4289392
## 7      7.247597             1.47920442 1.4813490
## 8      7.248490             1.40570605 1.5481951
## 9      7.223905             1.49438727 1.4781622
## 10     7.211349             1.48441494 1.5100420
## 11     7.146146             1.37538242 1.3762900
## 12     6.989888             1.10970628 1.4164037
## 13     6.941330             1.48709726 1.4599450
## 14     6.911343             1.54625928 1.4199206
## 15     6.910649             1.53570664 1.5582311
## 16     6.896619             1.48792338 1.4725204
## 17     6.826179             1.46378076 1.4623127
## 18     6.802314             1.74194360 1.4575837
## 19     6.644209             1.44163394 1.4964601
## 20     6.564749             1.25278461 1.2840250
## 21     6.573952             1.62634337 1.2664102
## 22     6.544531             1.10735321 1.4313060
## 23     6.534138             1.35268235 1.4338852
## 24     6.507915             1.18529546 1.4404511
## 25     6.484851             1.15318382 1.2108622
## 26     6.507277             1.69227767 1.3538144
## 27     6.455603             1.34327984 1.4884117
## 28     6.362094             1.21755970 1.4122279
## 29     6.341126             0.87200195 1.2555852
## 30     6.346870             1.23374844 1.3731925
## 31     6.368232             1.43092346 1.3877769
## 32     6.338883             1.12786877 1.4257925
## 33     6.349404             1.43362653 1.3845654
## 34     6.334945             1.38439786 1.5320909
## 35     6.181523             1.87076569 1.2742969
## 36     6.261980             1.07062232 1.4021829
## 37     6.243833             1.53062356 1.2866776
## 38     5.954467             1.36135590 1.3802285
## 39     6.018043             1.63295245 1.2596987
## 40     6.018652             1.32539356 1.5050592
## 41     5.995011             1.48841226 1.3231105
## 42     5.988021             1.29121542 1.2846460
## 43     5.955417             0.73729920 1.2872157
## 44     5.910152             1.00082040 1.2861688
## 45     5.897364             0.90978450 1.1821251
## 46     5.892092             1.29178786 1.4457120
## 47     5.876463             0.78644109 1.5489691
## 48     5.885264             1.39506662 1.4449233
## 49     5.895725             1.28177810 1.4692824
## 50     5.714757             0.90797532 1.0814178
## 51     5.849281             1.41691518 1.4363378
## 52     5.821330             1.31458235 1.4735161
## 53     5.765714             1.09186447 1.1462175
## 54     5.779736             1.26074862 1.4047149
## 55     5.753441             1.40167844 1.1282744
## 56     5.767629             0.72887063 1.2518256
## 57     5.730305             1.21768391 1.1500913
## 58     5.742023             0.83375657 1.2276191
## 59     5.758819             1.13077676 1.4931492
## 60     5.734358             1.28455627 1.3843690
## 61     5.722633             1.34691131 1.1863034
## 62     5.673775             1.34120595 1.4525188
## 63     5.618054             1.03522527 1.2187704
## 64     5.528138             1.18939555 1.2095610
## 65     5.527307             1.35593808 1.1313633
## 66     5.533860             1.32087934 1.4766711
## 67     5.491885             1.15655756 1.4449452
## 68     5.373046             1.10180306 1.3575643
## 69     5.405135             1.19827437 1.3377532
## 70     5.408619             0.93253732 1.5072849
## 71     5.394406             1.55167484 1.2627909
## 72     5.314665             0.85769922 1.2539176
## 73     5.298430             1.06931758 1.2581898
## 74     5.223590             0.99101239 1.2390889
## 75     5.244960             1.28601193 1.3431331
## 76     5.040601             0.92557931 1.3682181
## 77     5.194223             1.22255623 0.9679830
## 78     5.193152             0.95148438 1.1378535
## 79     5.226721             1.08116579 1.1608374
## 80     5.178016             0.72688353 0.6726907
## 81     5.171112             0.99553859 1.2744447
## 82     5.129968             1.12843120 1.4313376
```

```
## 83     5.132956               1.12112904 1.2383765
## 84     5.151659               0.87811458 0.7748644
## 85     5.168714               1.15360177 1.1524003
## 86     5.110939               1.07937384 1.4024167
## 87     5.128754               1.28948748 1.2394146
## 88     5.131118               1.07498753 1.1296242
## 89     5.104959               1.31517529 1.3670430
## 90     5.087665               0.98240942 1.0693359
## 91     5.060418               0.73057312 1.1439450
## 92     5.077828               1.06457794 1.2078930
## 93     5.059516               0.02264318 0.7211514
## 94     5.000719               0.78854758 1.2774913
## 95     4.938500               0.78375626 1.2157705
## 96     4.970574               0.52471364 1.2714633
## 97     4.942666               0.88541639 1.3401265
## 98     4.918080               0.59622008 1.3942386
## 99     4.856644               0.47982019 1.1792833
## 100    4.888320               1.02723587 1.4930112
## 101    4.728565               1.05469871 1.3847886
## 102    4.725633               1.00726581 0.8683515
## 103    4.668152               0.71624923 1.1556472
## 104    4.644866               0.98970181 0.9974714
## 105    4.624306               1.16145909 1.4343795
## 106    4.567357               0.36842093 0.9841360
## 107    4.593459               0.56430537 0.9460182
## 108    4.585775               1.15687311 0.7115512
## 109    4.535536               0.99619275 0.8036852
## 110    4.526178               0.58668298 0.7351317
## 111    4.377645               0.96443433 1.0984708
## 112    4.450308               0.56047946 1.0679507
## 113    4.325898               0.23430565 0.8707010
## 114    4.475260               0.36711055 1.1232359
## 115    4.468396               0.47930902 1.1796919
## 116    4.383894               0.63640678 1.0031873
## 117    4.371409               1.10271049 0.9786132
## 118    4.372639               1.19821024 1.1556202
## 119    4.377271               0.33923385 0.8646692
## 120    4.326553               1.00985014 1.2599764
## 121    4.285265               0.90059674 1.0074837
## 122    4.258478               0.79222125 0.7543726
## 123    4.206836               0.64845729 1.2720308
## 124    4.171946               0.80896425 0.8320444
## 125    4.197066               0.95061266 0.5706149
## 126    4.202190               0.09210235 1.2290235
## 127    4.110329               0.47618049 1.2814734
## 128    4.084817               0.60304892 0.9047800
## 129    4.057483               0.60176510 1.0062383
## 130    3.932253               0.65951669 1.2140086
## 131    4.017293               0.66722482 0.8736647
## 132    4.006590               0.89465195 1.3945376
## 133    3.966200               0.38143072 1.1298277
## 134    3.939941               0.35022771 1.0432800
## 135    3.944053               0.16192533 0.9930250
## 136    3.862521               0.23344204 0.5125688
## 137    3.837289               0.43801299 0.9538559
## 138    3.771300               0.37584653 1.0830959
## 139    3.571656               0.52102125 1.1900952
## 140    3.638358               0.85842818 1.1044120
## 141    3.714338               0.40147722 0.5815433
## 142    3.657877               1.12209415 1.2215550
## 143    3.568217               0.43108541 0.4352998
## 144    3.573681               0.30580869 0.9130204
## 145    3.471285               0.36861026 0.6404498
## 146    3.493250               0.59168345 0.9353822
## 147    3.456462               0.39724863 0.6013231
## 148    3.412244               0.11904179 0.8721179
## 149    3.429572               0.24454993 0.7912447
## 150    3.395962               0.30544472 0.4318825
## 151    3.398970               0.36874589 0.9457070
## 152    3.260331               0.77715313 0.3961026
## 153    3.236570               0.51113588 1.0419898
## 154    2.735310               0.09162257 0.6297936
## 155    2.521116               0.00000000 0.0000000
##     Health..Life.Expectancy.    Freedom Generosity
## 1                0.796666503 0.63542259 0.36201224
## 2                0.792565525 0.62600672 0.35528049
## 3                0.833552122 0.62716264 0.47554022
## 4                0.858131289 0.62007058 0.29054928
## 5                0.809157670 0.61795086 0.24548277
## 6                0.810696125 0.58538449 0.47048983
```

```
## 7               0.834557652 0.61110091 0.43553972
## 8               0.816759706 0.61406213 0.50000513
## 9               0.830875158 0.61292410 0.38539925
## 10              0.843886793 0.60160738 0.47769925
## 11              0.838404000 0.40598860 0.33008265
## 12              0.759509265 0.58013165 0.21461323
## 13              0.815328419 0.56776619 0.31647232
## 14              0.774286628 0.50574052 0.39257878
## 15              0.809782624 0.57311034 0.42785832
## 16              0.798950732 0.56251138 0.33626917
## 17              0.818091869 0.53977072 0.23150334
## 18              0.845089495 0.59662789 0.28318098
## 19              0.805335939 0.50819004 0.49277416
## 20              0.819479704 0.37689528 0.32666242
## 21              0.726798236 0.60834527 0.36094195
## 22              0.616552353 0.43745375 0.16234989
## 23              0.754444003 0.49094617 0.08810676
## 24              0.695137084 0.49451920 0.10945706
## 25              0.709978998 0.41273001 0.12099043
## 26              0.949492395 0.54984057 0.34596598
## 27              0.821944237 0.58876705 0.57473058
## 28              0.719216824 0.57939225 0.17509693
## 29              0.540239990 0.53131062 0.28348839
## 30              0.706156135 0.55002683 0.21055694
## 31              0.844465852 0.47022212 0.12976231
## 32              0.647239029 0.58020073 0.57212311
## 33              0.793984234 0.36146659 0.25836048
## 34              0.888960600 0.40878123 0.19013357
## 35              0.710098088 0.60413098 0.33047387
## 36              0.595027924 0.47748742 0.14901447
## 37              0.590148330 0.44975057 0.14761601
## 38              0.519983292 0.51863074 0.32529646
## 39              0.632105708 0.49633759 0.22828980
## 40              0.712732911 0.29581746 0.13654448
## 41              0.653133035 0.53674692 0.17266849
## 42              0.618784428 0.40226498 0.41660893
## 43              0.653095961 0.44755185 0.30167422
## 44              0.685636222 0.45519820 0.15011247
## 45              0.596018553 0.43245253 0.07825799
## 46              0.699475348 0.52034211 0.15846597
## 47              0.498272628 0.65824866 0.41598365
## 48              0.853144348 0.25645071 0.17278965
## 49              0.547349334 0.37378311 0.05226382
## 50              0.450191766 0.54750937 0.24001564
## 51              0.913475871 0.50562555 0.12057277
## 52              0.628949940 0.23423178 0.01016466
## 53              0.617584646 0.23333581 0.06943665
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## 55              0.900214076 0.25792167 0.20667437
## 56              0.589465201 0.24072905 0.20877913
## 57              0.685158312 0.45700374 0.13351992
## 58              0.473630250 0.55873293 0.22556072
## 59              0.437726080 0.41827193 0.24992499
## 60              0.606041551 0.43745428 0.20196442
## 61              0.834647238 0.47120363 0.26684570
## 62              0.790828228 0.57257581 0.24264909
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## 64              0.638007462 0.49124733 0.36093375
## 65              0.844714701 0.35511154 0.27125430
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## 68              0.520169020 0.46573323 0.15207367
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## 72              0.468009055 0.58521467 0.19351342
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## 76              0.641022384 0.47430724 0.23381834
## 77              0.701288521 0.25577229 0.24800298
## 78              0.541452050 0.26028794 0.31993145
## 79              0.741415501 0.47278771 0.02880684
## 80              0.402047783 0.23521526 0.31544602
## 81              0.492345721 0.44332346 0.61170459
## 82              0.617144227 0.15399712 0.06501963
## 83              0.667464674 0.19498906 0.19791102
## 84              0.597710669 0.40815833 0.03220996
## 85              0.540775776 0.39815584 0.04526934
## 86              0.574873745 0.55258983 0.18696785
```

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## 87              0.810198903 0.09573125 0.00000000
## 88              0.735081077 0.28851599 0.26445076
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## 90              0.705186307 0.20440318 0.32886750
## 91              0.582569480 0.34807986 0.23618887
## 92              0.644948184 0.32590598 0.25376096
## 93              0.113989137 0.60212696 0.29163131
## 94              0.652168989 0.57105559 0.23496805
## 95              0.056915730 0.39495257 0.23094720
## 96              0.529235125 0.47156671 0.24899764
## 97              0.495879292 0.50153768 0.47405455
## 98              0.553457797 0.45494339 0.42858037
## 99              0.504130781 0.44030595 0.39409617
## 100             0.557783484 0.39414397 0.33846423
## 101             0.187080070 0.47924674 0.13936238
## 102             0.613212049 0.28968069 0.04969336
## 103             0.565666974 0.25471106 0.11417317
## 104             0.520187259 0.28211015 0.12863144
## 105             0.708217680 0.28923172 0.11317769
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## 107             0.132892117 0.43038875 0.23629846
## 108             0.639333189 0.24932261 0.38724291
## 109             0.731159747 0.38149863 0.20131294
## 110             0.533241034 0.47835666 0.17225535
## 111             0.338611811 0.52030355 0.07713374
## 112             0.309988350 0.45276377 0.44486031
## 113             0.106654435 0.48079109 0.32222810
## 114             0.397522569 0.51449203 0.83807516
## 115             0.409362853 0.37792227 0.18346889
## 116             0.257835895 0.46160349 0.24958014
## 117             0.501180470 0.28855553 0.19963726
## 118             0.356578588 0.31232858 0.04378538
## 119             0.353409708 0.40884274 0.31265074
## 120             0.625130832 0.56121325 0.49086356
## 121             0.637524426 0.19830327 0.08348809
## 122             0.455427617 0.46998700 0.23153849
## 123             0.285349280 0.09609804 0.20187002
## 124             0.289957434 0.43502587 0.12085213
## 125             0.649546981 0.30941004 0.05400882
## 126             0.191407025 0.23596135 0.24645583
## 127             0.169365674 0.30661374 0.18335420
## 128             0.048642170 0.44770619 0.20123747
## 129             0.429783404 0.63337582 0.38592297
## 130             0.290920824 0.01499586 0.18231745
## 131             0.295637727 0.42302629 0.25692394
## 132             0.575903952 0.12297478 0.27006146
## 133             0.217632607 0.44318596 0.32576606
## 134             0.215844259 0.32436785 0.25086468
## 135             0.268505007 0.36365870 0.22867385
## 136             0.315089583 0.46691465 0.28717047
## 137             0.041134715 0.16234203 0.21611385
## 138             0.196763754 0.33638421 0.18914349
## 139             0.000000000 0.39066130 0.15749727
## 140             0.049868666 0.00000000 0.09792649
## 141             0.180746779 0.10617952 0.31187093
## 142             0.341755509 0.50519633 0.09934845
## 143             0.209930211 0.42596278 0.20794846
## 144             0.375223309 0.18919677 0.20873253
## 145             0.277321130 0.03036986 0.48920378
## 146             0.310080916 0.24946372 0.10412521
## 147             0.163486004 0.14706244 0.28567082
## 148             0.229918197 0.33288118 0.26654989
## 149             0.194129139 0.34858751 0.26481509
## 150             0.247105569 0.38042614 0.19689615
## 151             0.326424807 0.58184385 0.25275603
## 152             0.500533342 0.08153944 0.49366373
## 153             0.364509284 0.39001778 0.35425636
## 154             0.151610792 0.05990075 0.20443518
## 155             0.018772686 0.27084205 0.28087649
##     Trust..Government.Corruption. Dystopia.Residual
## 1                       0.315963835         2.2770267
## 2                       0.400770068         2.3137074
## 3                       0.153526559         2.3227153
## 4                       0.367007285         2.2767162
## 5                       0.382611543         2.4301815
## 6                       0.282661825         2.2948041
## 7                       0.287371516         2.1872644
## 8                       0.382816702         2.0464563
## 9                       0.384398729         2.0975380
## 10                      0.301183730         2.0652108
```

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## 11                  0.085242100        2.8017573
## 12                  0.100106589        2.8986392
## 13                  0.221060365        2.1385064
## 14                  0.135638788        2.2181134
## 15                  0.298388153        1.7738690
## 16                  0.276731938        2.0157700
## 17                  0.251343131        2.1242104
## 18                  0.318834424        1.6195121
## 19                  0.265428066        1.7041435
## 20                  0.082287982        2.5095859
## 21                  0.324489564        1.7347035
## 22                  0.111092761        2.7692671
## 23                  0.036872927        2.4518619
## 24                  0.059739888        2.6140053
## 25                  0.132774115        2.8371549
## 26                  0.464307785        1.2163620
## 27                  0.153066069        1.5568628
## 28                  0.178061873        2.1724095
## 29                  0.077223279        2.8938911
## 30                  0.070983924        2.3072000
## 31                  0.172502428        2.0059547
## 32                  0.031612735        2.0395083
## 33                  0.063829236        2.1266074
## 34                  0.070914097        1.9277577
## 35                  0.439299256        1.1454644
## 36                  0.046668742        2.6160681
## 37                  0.273432255        2.0654297
## 38                  0.008964816        2.0532475
## 39                  0.215159550        1.6404252
## 40                  0.024210852        2.0977767
## 41                  0.257042170        1.6561494
## 42                  0.065600708        2.0044489
## 43                  0.130687982        2.5139306
## 44                  0.140134647        2.2903526
## 45                  0.089980960        2.7145939
## 46                  0.059307806        1.7977228
## 47                  0.246528223        1.8169136
## 48                  0.028028091        1.8133121
## 49                  0.032962881        2.2056074
## 50                  0.096581072        2.6319556
## 51                  0.163760737        1.3632236
## 52                  0.011865643        2.2284405
## 53                  0.146096110        2.5676038
## 54                  0.073842727        1.9936552
## 55                  0.063282669        1.8803780
## 56                  0.010091286        2.8078084
## 57                  0.004387901        2.1768315
## 58                  0.060477726        2.4432790
## 59                  0.259270340        1.8329098
## 60                  0.119282886        1.7848926
## 61                  0.155353352        1.5491576
## 62                  0.045128979        1.3133173
## 63                  0.047049087        2.2072694
## 64                  0.042181555        1.6975839
## 65                  0.041237976        1.6212492
## 66                  0.183248922        1.3575087
## 67                  0.156313822        1.7232330
## 68                  0.092610210        1.8350112
## 69                  0.099671580        1.8792779
## 70                  0.091065913        1.6853335
## 71                  0.293933749        0.5546331
## 72                  0.099331893        1.9726048
## 73                  0.040903781        1.9470844
## 74                  0.119803272        1.7911766
## 75                  0.036636937        1.7164593
## 76                  0.055267781        1.6123257
## 77                  0.043103110        1.8544924
## 78                  0.057471618        2.0105407
## 79                  0.022794275        1.7649386
## 80                  0.124348067        2.7924893
## 81                  0.015317135        1.4294770
## 82                  0.064491123        1.7894638
## 83                  0.088174194        1.7291915
## 84                  0.087763183        2.4561894
## 85                  0.180987507        1.7624817
## 86                  0.113945253        1.3194652
## 87                  0.043289777        1.7492216
## 88                  0.037513830        1.6950738
## 89                  0.015869452        1.1076827
## 90                  0.000000000        1.8921726
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## 91                    0.073345453         2.0658112
## 92                    0.060277794         1.6174693
## 93                    0.282410324         3.1174846
## 94                    0.087633237         1.4623187
## 95                    0.026121566         2.3653905
## 96                    0.146377146         1.8490493
## 97                    0.173380390         1.1401844
## 98                    0.039439179         1.5367231
## 99                    0.072975546         1.8912411
## 100                   0.032902289         1.1112924
## 101                   0.072509497         1.5109086
## 102                   0.086723149         1.8902512
## 103                   0.089282602         1.8788903
## 104                   0.114381365         1.7021611
## 105                   0.011051531         0.9961393
## 106                   0.071095176         2.6684599
## 107                   0.051306631         2.3336456
## 108                   0.048761073         1.4987350
## 109                   0.039864216         1.4904416
## 110                   0.123717859         1.9787362
## 111                   0.093146972         1.4818902
## 112                   0.064641319         1.6519022
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## 116                   0.078213550         1.8267055
## 117                   0.107215755         1.3189073
## 118                   0.076046787         1.3229163
## 119                   0.165455714         2.0157437
## 120                   0.073653966         0.4193892
## 121                   0.026674422         1.5214992
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## 127                   0.104970247         1.6681910
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## 130                   0.089847520         1.6870658
## 131                   0.025336370         1.5778675
## 132                   0.023029471         0.8143823
## 133                   0.057069719         1.5263627
## 134                   0.120328106         1.7272129
## 135                   0.138572946         1.8739834
## 136                   0.072711654         2.0817862
## 137                   0.053581882         2.0712380
## 138                   0.095375381         1.5979702
## 139                   0.119094640         1.4298353
## 140                   0.069720335         1.6144824
## 141                   0.061157830         2.1508012
## 142                   0.098583199         0.3779137
## 143                   0.060929015         1.8856310
## 144                   0.067231975         1.5846126
## 145                   0.099872150         1.6971676
## 146                   0.056767423         1.3456006
## 147                   0.116793513         1.8795674
## 148                   0.038948249         1.6732860
## 149                   0.110937618         1.5523119
## 150                   0.095665015         1.8372293
## 151                   0.455220014         0.5400612
## 152                   0.151347131         1.0615735
## 153                   0.066035107         0.6211305
## 154                   0.084147945         1.6830242
## 155                   0.056565076         2.0660048
```

```
names(happiness2017)
```

```
##  [1] "Country"                       "Happiness.Rank"
##  [3] "Happiness.Score"               "Whisker.high"
##  [5] "Whisker.low"                   "Economy..GDP.per.Capita."
##  [7] "Family"                        "Health..Life.Expectancy."
##  [9] "Freedom"                       "Generosity"
## [11] "Trust..Government.Corruption." "Dystopia.Residual"
```

```
attach(happiness2017)
```

```
## The following objects are masked from happiness2016:
##
##     Country, Dystopia.Residual, Economy..GDP.per.Capita., Family,
##     Freedom, Generosity, Happiness.Rank, Happiness.Score,
##     Health..Life.Expectancy., Trust..Government.Corruption.
```

```
## The following objects are masked from happiness2015:
##
##     Country, Dystopia.Residual, Economy..GDP.per.Capita., Family,
##     Freedom, Generosity, Happiness.Rank, Happiness.Score,
##     Health..Life.Expectancy., Trust..Government.Corruption.
```

```
str(happiness2017)
```

```
## 'data.frame':    155 obs. of  12 variables:
##  $ Country                      : Factor w/ 155 levels "Afghanistan",..: 105 38 58 133 45 99 26 100 132 7 ...
##  $ Happiness.Rank               : int  1 2 3 4 5 6 7 8 9 10 ...
##  $ Happiness.Score              : num  7.54 7.52 7.5 7.49 7.47 ...
##  $ Whisker.high                 : num  7.59 7.58 7.62 7.56 7.53 ...
##  $ Whisker.low                  : num  7.48 7.46 7.39 7.43 7.41 ...
##  $ Economy..GDP.per.Capita.     : num  1.62 1.48 1.48 1.56 1.44 ...
##  $ Family                       : num  1.53 1.55 1.61 1.52 1.54 ...
##  $ Health..Life.Expectancy.     : num  0.797 0.793 0.834 0.858 0.809 ...
##  $ Freedom                      : num  0.635 0.626 0.627 0.62 0.618 ...
##  $ Generosity                   : num  0.362 0.355 0.476 0.291 0.245 ...
##  $ Trust..Government.Corruption.: num  0.316 0.401 0.154 0.367 0.383 ...
##  $ Dystopia.Residual            : num  2.28 2.31 2.32 2.28 2.43 ...
```

```
View(happiness2017)
```

## Refine

# Rename column names

```
dim(openData)
```

```
## [1] 149   8
```

```
str(openData)
```

```
## 'data.frame':    149 obs. of  8 variables:
##  $ Country.Code: Factor w/ 149 levels "AE","AG","AL",..: 135 45 35 30 43 7 140 139 99 100 ...
##  $ Country.Name: Factor w/ 149 levels "Albania","Algeria",..: 127 140 36 31 43 7 142 141 93 97 ...
##  $ X2015.Rank  : int  1 2 3 4 5 5 7 8 8 10 ...
##  $ X2015.Score : int  78 76 70 68 67 67 66 64 64 63 ...
##  $ X2014.Rank  : int  11 1 2 12 4 5 13 8 17 7 ...
##  $ X2014.Score : int  67 97 83 66 73 72 66 70 64 71 ...
##  $ X2013.Rank  : int  36 1 2 61 7 9 61 2 5 4 ...
##  $ X2013.Score : int  42 94 87 0 72 66 0 87 74 76 ...
```

```
column_name = c('code','Country','RankOf2015','ScoreOf2015','RankOf2014','ScoreOf2014',
                'RankOf2013','ScoreOf2013')
colnames(openData) = column_name
str(openData)
```

```
## 'data.frame':    149 obs. of  8 variables:
##  $ code       : Factor w/ 149 levels "AE","AG","AL",..: 135 45 35 30 43 7 140 139 99 100 ...
##  $ Country    : Factor w/ 149 levels "Albania","Algeria",..: 127 140 36 31 43 7 142 141 93 97 ...
##  $ RankOf2015 : int  1 2 3 4 5 5 7 8 8 10 ...
##  $ ScoreOf2015: int  78 76 70 68 67 67 66 64 64 63 ...
##  $ RankOf2014 : int  11 1 2 12 4 5 13 8 17 7 ...
##  $ ScoreOf2014: int  67 97 83 66 73 72 66 70 64 71 ...
##  $ RankOf2013 : int  36 1 2 61 7 9 61 2 5 4 ...
##  $ ScoreOf2013: int  42 94 87 0 72 66 0 87 74 76 ...
```

# Join the two dataset files on “Country”

## Keep only columns I plan to use

```
open_data_happiness <- openData %>%
  left_join(happiness2015, by = "Country") %>%
  #mutate(Country = factor(Country)) %>%

  select(Country, Region, ScoreOf2015, Happiness.Score, Economy..GDP.per.Capita.,
         Family, Health..Life.Expectancy., Freedom, Trust..Government.Corruption.,
         Generosity, Dystopia.Residual)
```

```
## Warning: Column `Country` joining factors with different levels, coercing
## to character vector
```

```
dim(open_data_happiness)
```

```
## [1] 149  11
```

```
str(open_data_happiness)
```

```
## 'data.frame':    149 obs. of  11 variables:
##  $ Country                    : chr  "Taiwan" "United Kingdom" "Denmark" "Colombia" ...
##  $ Region                     : Factor w/ 10 levels "Australia and New Zealand",..: 3 10 10 4 10 1 4 6 10 1
0 ...
##  $ ScoreOf2015                : int  78 76 70 68 67 67 66 64 64 63 ...
##  $ Happiness.Score            : num  6.3 6.87 7.53 6.48 7.41 ...
##  $ Economy..GDP.per.Capita.   : num  1.291 1.266 1.325 0.919 1.29 ...
##  $ Family                     : num  1.08 1.29 1.36 1.24 1.32 ...
##  $ Health..Life.Expectancy.   : num  0.875 0.909 0.875 0.691 0.889 ...
##  $ Freedom                    : num  0.397 0.596 0.649 0.535 0.642 ...
##  $ Trust..Government.Corruption.: num  0.0813 0.3207 0.4836 0.0512 0.4137 ...
##  $ Generosity                 : num  0.254 0.519 0.341 0.184 0.234 ...
##  $ Dystopia.Residual          : num  2.32 1.97 2.49 2.86 2.62 ...
```

```
View(open_data_happiness)
```

## Give the columns nicer names now that our data is in one dataframe

```
colnames(open_data_happiness) <- c("Country", "Region", "Openness", "Happiness", "GDP", "Family", "Health", "Free
dom", "Trust", "Generosity", "DystopiaResidual")
str(open_data_happiness)
```

```
## 'data.frame':    149 obs. of  11 variables:
##  $ Country         : chr  "Taiwan" "United Kingdom" "Denmark" "Colombia" ...
##  $ Region          : Factor w/ 10 levels "Australia and New Zealand",..: 3 10 10 4 10 1 4 6 10 10 ...
##  $ Openness        : int  78 76 70 68 67 67 66 64 64 63 ...
##  $ Happiness       : num  6.3 6.87 7.53 6.48 7.41 ...
##  $ GDP             : num  1.291 1.266 1.325 0.919 1.29 ...
##  $ Family          : num  1.08 1.29 1.36 1.24 1.32 ...
##  $ Health          : num  0.875 0.909 0.875 0.691 0.889 ...
##  $ Freedom         : num  0.397 0.596 0.649 0.535 0.642 ...
##  $ Trust           : num  0.0813 0.3207 0.4836 0.0512 0.4137 ...
##  $ Generosity      : num  0.254 0.519 0.341 0.184 0.234 ...
##  $ DystopiaResidual: num  2.32 1.97 2.49 2.86 2.62 ...
```

```
View(open_data_happiness)

## Replace the Region with Country for the rows which don't have Region

##open_data_happiness$Region[is.na(open_data_happiness$Region)] = ##open_data_happiness$Country[is.na(open_data_h
appiness$Region)]
##View(open_data_happiness)
```

## Usagage of the Package formattable - To look at the characteristics of the top 10 countries with the highest scores for their open data sharing policies:

## I st Part - Is happiness correlated with open data?

```
open_data_happiness %>%
  # Which countries are the most open?
  arrange(desc(Openness)) %>%
  # Round our numeric variables to two decimal places
  mutate_each(funs(round(., 2)), -c(Country, Region, Openness)) %>%
  head(10) %>%
  formattable(list(
    Openness = color_bar("yellow"),
    Happiness = color_bar("lightgreen"),
    GDP = color_bar("deepskyblue"),
    Family = color_bar("deepskyblue"),
    Health = color_bar("deepskyblue"),
    Freedom = color_bar("deepskyblue"),
    Trust = color_bar("deepskyblue"),
    Generosity = color_bar("deepskyblue"),
    DystopiaResidual = color_bar("deepskyblue")
  ), align = "l")
```

```
## Warning: package 'bindrcpp' was built under R version 3.4.1
```

```
## `mutate_each()` is deprecated.
## Use `mutate_all()`, `mutate_at()` or `mutate_if()` instead.
## To map `funs` over a selection of variables, use `mutate_at()`
```

| Country | Region | Openness | Happiness | GDP | Family | Health | Freedom | Trust | Generosity | DystopiaResidual |
|---|---|---|---|---|---|---|---|---|---|---|
| Taiwan | Eastern Asia | 78 | 6.30 | 1.29 | 1.08 | 0.88 | 0.40 | 0.08 | 0.25 | 2.32 |
| United Kingdom | Western Europe | 76 | 6.87 | 1.27 | 1.29 | 0.91 | 0.60 | 0.32 | 0.52 | 1.97 |
| Denmark | Western Europe | 70 | 7.53 | 1.33 | 1.36 | 0.87 | 0.65 | 0.48 | 0.34 | 2.49 |
| Colombia | Latin America and Caribbean | 68 | 6.48 | 0.92 | 1.24 | 0.69 | 0.53 | 0.05 | 0.18 | 2.86 |
| Finland | Western Europe | 67 | 7.41 | 1.29 | 1.32 | 0.89 | 0.64 | 0.41 | 0.23 | 2.62 |
| Australia | Australia and New Zealand | 67 | 7.28 | 1.33 | 1.31 | 0.93 | 0.65 | 0.36 | 0.44 | 2.27 |
| Uruguay | Latin America and Caribbean | 66 | 6.49 | 1.06 | 1.21 | 0.81 | 0.60 | 0.25 | 0.23 | 2.32 |
| United States | North America | 64 | 7.12 | 1.39 | 1.25 | 0.86 | 0.55 | 0.16 | 0.40 | 2.51 |
| Netherlands | Western Europe | 64 | 7.38 | 1.33 | 1.28 | 0.89 | 0.62 | 0.32 | 0.48 | 2.47 |
| Norway | Western Europe | 63 | 7.52 | 1.46 | 1.33 | 0.89 | 0.67 | 0.37 | 0.35 | 2.47 |

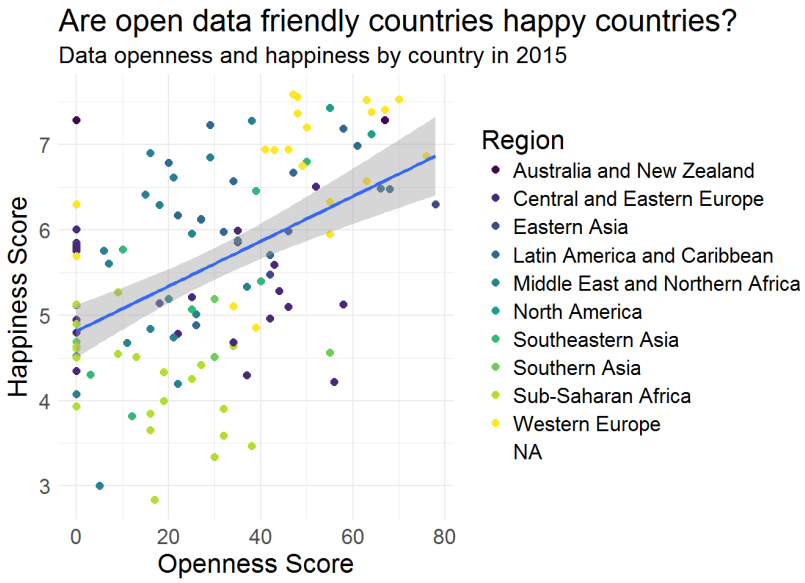
## 2 nd Part - Are open countries happy countries?.

## countries that index highly for data openness are also home to happy people.

```
ggplot(open_data_happiness,
  aes(x = Openness,
      y = Happiness)) +
  geom_point(aes(colour = Region),
             size = 2) +
  geom_smooth(method="lm") +
  labs(x = "Openness Score",
       y = "Happiness Score",
       title = "Are open data friendly countries happy countries?",
       subtitle = "Data openness and happiness by country in 2015") +
  scale_color_viridis(discrete = T) +
  theme_minimal() +
  theme(text = element_text(size=16))
```

```
## Warning: Removed 31 rows containing non-finite values (stat_smooth).
```

```
## Warning: Removed 31 rows containing missing values (geom_point).
```




# 3 rd Part - Happiness Trends

## Has the happiness score remained the same over the years?

## Renaming column names so that it will be recognisable in joint

```
colnames(happiness2015)[3:12]=paste("fif",colnames(happiness2015)[3:12],sep="_")
colnames(happiness2016)[3:12]=paste("six",colnames(happiness2016)[3:12],sep="_")
colnames(happiness2017)[2:12]=paste("seven",colnames(happiness2017)[2:12],sep="_")
View(happiness2015)
View(happiness2016)
View(happiness2017)
```

## Doing Left Joint

```
open_happy=happiness2015 %>% left_join(happiness2016,by="Country") %>% left_join(happiness2017,by="Country")
```

```
## Warning: Column `Country` joining factors with different levels, coercing
## to character vector
```

```
## Warning: Column `Country` joining character vector and factor, coercing
## into character vector
```

```
open_happy$Country=as.factor(open_happy$Country)
str(open_happy)
```

```
## 'data.frame':    158 obs. of  35 variables:
##  $ Country                          : Factor w/ 158 levels "Afghanistan",..: 136 59 38 106 25 46 100 135 10
1 7 ...
##  $ Region.x                         : Factor w/ 10 levels "Australia and New Zealand",..: 10 10 10 10 6 10 1
0 10 1 1 ...
##  $ fif_Happiness.Rank               : int  1 2 3 4 5 6 7 8 9 10 ...
##  $ fif_Happiness.Score              : num  7.59 7.56 7.53 7.52 7.43 ...
##  $ fif_Standard.Error               : num  0.0341 0.0488 0.0333 0.0388 0.0355 ...
##  $ fif_Economy..GDP.per.Capita.     : num  1.4 1.3 1.33 1.46 1.33 ...
##  $ fif_Family                       : num  1.35 1.4 1.36 1.33 1.32 ...
##  $ fif_Health..Life.Expectancy.     : num  0.941 0.948 0.875 0.885 0.906 ...
##  $ fif_Freedom                      : num  0.666 0.629 0.649 0.67 0.633 ...
##  $ fif_Trust..Government.Corruption.  : num  0.42 0.141 0.484 0.365 0.33 ...
##  $ fif_Generosity                   : num  0.297 0.436 0.341 0.347 0.458 ...
##  $ fif_Dystopia.Residual            : num  2.52 2.7 2.49 2.47 2.45 ...
##  $ Region.y                         : Factor w/ 10 levels "Australia and New Zealand",..: 10 10 10 10 6 10 1
0 10 1 1 ...
##  $ six_Happiness.Rank               : int  2 3 1 4 6 5 7 10 8 9 ...
##  $ six_Happiness.Score              : num  7.51 7.5 7.53 7.5 7.4 ...
##  $ six_Lower.Confidence.Interval    : num  7.43 7.33 7.46 7.42 7.33 ...
##  $ six_Upper.Confidence.Interval    : num  7.59 7.67 7.59 7.58 7.47 ...
##  $ six_Economy..GDP.per.Capita.     : num  1.53 1.43 1.44 1.58 1.44 ...
##  $ six_Family                       : num  1.15 1.18 1.16 1.13 1.1 ...
##  $ six_Health..Life.Expectancy.     : num  0.863 0.867 0.795 0.796 0.828 ...
##  $ six_Freedom                      : num  0.586 0.566 0.579 0.596 0.574 ...
##  $ six_Trust..Government.Corruption.  : num  0.412 0.15 0.445 0.358 0.313 ...
##  $ six_Generosity                   : num  0.281 0.477 0.362 0.379 0.448 ...
##  $ Dystopia.Residual                : num  2.69 2.83 2.74 2.66 2.7 ...
##  $ seven_Happiness.Rank             : int  4 3 2 1 7 5 6 9 8 10 ...
##  $ seven_Happiness.Score            : num  7.49 7.5 7.52 7.54 7.32 ...
##  $ seven_Whisker.high               : num  7.56 7.62 7.58 7.59 7.38 ...
##  $ seven_Whisker.low                : num  7.43 7.39 7.46 7.48 7.25 ...
##  $ seven_Economy..GDP.per.Capita.   : num  1.56 1.48 1.48 1.62 1.48 ...
##  $ seven_Family                     : num  1.52 1.61 1.55 1.53 1.48 ...
##  $ seven_Health..Life.Expectancy.   : num  0.858 0.834 0.793 0.797 0.835 ...
##  $ seven_Freedom                    : num  0.62 0.627 0.626 0.635 0.611 ...
##  $ seven_Generosity                 : num  0.291 0.476 0.355 0.362 0.436 ...
##  $ seven_Trust..Government.Corruption.: num  0.367 0.154 0.401 0.316 0.287 ...
##  $ seven_Dystopia.Residual          : num  2.28 2.32 2.31 2.28 2.19 ...
```

```
View(open_happy)
```

# Visualising the trend

# names(open_happy)

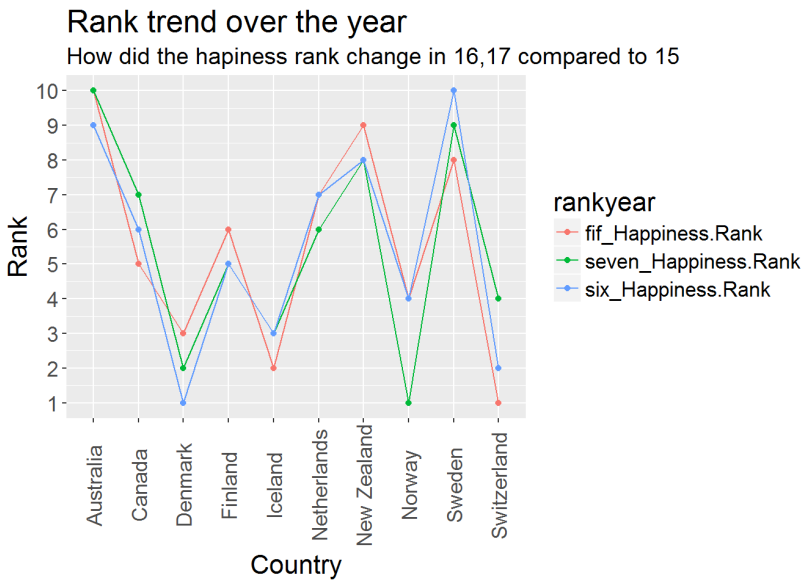
```
open_happy  %>% head(10) %>% select(Country,Region.x,fif_Happiness.Rank,fif_Happiness.Score,six_Happiness.Rank,si
x_Happiness.Score,seven_Happiness.Rank,seven_Happiness.Score) %>% formattable(list(fif_Happiness.Rank=color_bar
("yellow"),fif_Happiness.Score=color_bar("lightgreen"),six_Happiness.Rank=color_bar("yellow"),six_Happiness.Score
=color_bar("lightgreen"),seven_Happiness.Rank=color_bar("yellow"),seven_Happiness.Score=color_bar("lightgreen")),
align="l")
```

| Country | Region.x | fif_Happiness.Rank | fif_Happiness.Score | six_Happiness.Rank | six_Happiness.Score | seven_Happiness.Rank | seven_Happine |
|---|---|---|---|---|---|---|---|
| Switzerland | Western Europe | 1 | 7.587 | 2 | 7.509 | 4 | 7.494 |
| Iceland | Western Europe | 2 | 7.561 | 3 | 7.501 | 3 | 7.504 |
| Denmark | Western Europe | 3 | 7.527 | 1 | 7.526 | 2 | 7.522 |
| Norway | Western Europe | 4 | 7.522 | 4 | 7.498 | 1 | 7.537 |
| Canada | North America | 5 | 7.427 | 6 | 7.404 | 7 | 7.316 |
| Finland | Western Europe | 6 | 7.406 | 5 | 7.413 | 5 | 7.469 |
| Netherlands | Western Europe | 7 | 7.378 | 7 | 7.339 | 6 | 7.377 |
| Sweden | Western Europe | 8 | 7.364 | 10 | 7.291 | 9 | 7.284 |

| Country | Region.x | fif_Happiness.Rank | fif_Happiness.Score | six_Happiness.Rank | six_Happiness.Score | seven_Happiness.Rank | seven_Happine |
|---|---|---|---|---|---|---|---|
| New Zealand | Australia and New Zealand | 9 | 7.286 | 8 | 7.334 | 8 | 7.314 |
| Australia | Australia and New Zealand | 10 | 7.284 | 9 | 7.313 | 10 | 7.284 |

```
View(open_happy)
```

```
temp=open_happy %>% select(Country,Region.x,fif_Happiness.Rank,six_Happiness.Rank,seven_Happiness.Rank,fif_Happin
ess.Score,six_Happiness.Score,seven_Happiness.Score)
#Create 2 temp dataframe for ggplot vis
temp.rank=gather(temp,"rankyear","rank",3:5)
temp.score=gather(temp,"scoreyear","score",3:5)
temp.order=ddply(temp.rank,"rankyear",function(x) head(x[order(x$rank,decreasing=FALSE),],10))
temp.order %>% ggplot(aes(x=Country,y=rank,group=rankyear,color=rankyear))+geom_line(stat="identity",na.rm=FALSE)
+geom_point()+theme(legend.position="right",axis.text.x=element_text(angle=90,vjust=0.5),text=element_text(size=1
6))+labs(x="Country",y="Rank",title="Rank trend over the year",subtitle="How did the hapiness rank change in 16,1
7 compared to 15")+coord_cartesian(xlim=c(1,10))+scale_y_continuous(breaks=seq(1,10,1))
```

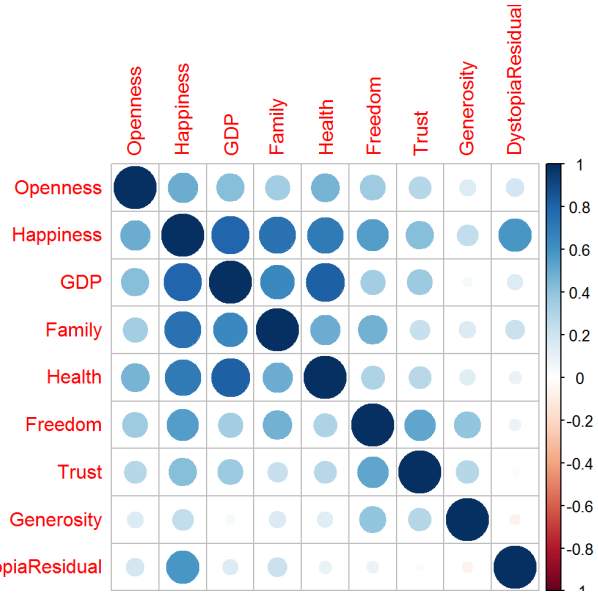



## 4 th Part - What other measures are correlated with “Openness”?

```
# Subset the data to include only the variables we want to look at
open_data_corr <- open_data_happiness %>%
  select(Openness, Happiness, GDP, Family, Health,
         Freedom, Trust, Generosity, DystopiaResidual) %>%
  mutate(Openness = as.numeric(Openness))

od_corr <- cor(open_data_corr, use = "complete", method = "pearson")

corrplot(od_corr)
```




## 5th Part - Which factor does the happiness score depends upon ?

## 2015 Scores

```
temp=open_happy[3:12]
model=lm(temp$fif_Happiness.Score~ temp$fif_Economy..GDP.per.Capita.+temp$fif_Family+temp$fif_Health..Life.Expect
ancy.+temp$fif_Freedom+temp$fif_Freedom+temp$fif_Trust..Government.Corruption.+temp$fif_Generosity)
summary(model)
```

```
##
## Call:
## lm(formula = temp$fif_Happiness.Score ~ temp$fif_Economy..GDP.per.Capita. +
##     temp$fif_Family + temp$fif_Health..Life.Expectancy. + temp$fif_Freedom +
##     temp$fif_Freedom + temp$fif_Trust..Government.Corruption. +
##     temp$fif_Generosity)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -1.40484 -0.31734 -0.02814  0.37189  1.50130
##
## Coefficients:
##                                     Estimate Std. Error t value
## (Intercept)                           1.8602     0.1905   9.766
## temp$fif_Economy..GDP.per.Capita.     0.8607     0.2203   3.907
## temp$fif_Family                       1.4089     0.2227   6.327
## temp$fif_Health..Life.Expectancy.     0.9753     0.3163   3.084
## temp$fif_Freedom                      1.3334     0.3850   3.463
## temp$fif_Trust..Government.Corruption.   0.7845     0.4365   1.797
## temp$fif_Generosity                   0.3889     0.3910   0.995
##                                     Pr(>|t|)
## (Intercept)                          < 2e-16 ***
## temp$fif_Economy..GDP.per.Capita.    0.000141 ***
## temp$fif_Family                      2.69e-09 ***
## temp$fif_Health..Life.Expectancy.    0.002433 **
## temp$fif_Freedom                     0.000694 ***
## temp$fif_Trust..Government.Corruption. 0.074302 .
## temp$fif_Generosity                  0.321471
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.551 on 151 degrees of freedom
## Multiple R-squared:  0.7772, Adjusted R-squared:  0.7684
## F-statistic: 87.81 on 6 and 151 DF,  p-value: < 2.2e-16
```

```
## 2016 Scores

temp=open_happy[14:25]
model=lm(temp$six_Happiness.Score~ temp$six_Economy..GDP.per.Capita.+temp$six_Family+temp$six_Health..Life.Expect
ancy.+temp$six_Freedom+temp$six_Trust..Government.Corruption.+temp$six_Generosity)
summary(model)
```

```
##
## Call:
## lm(formula = temp$six_Happiness.Score ~ temp$six_Economy..GDP.per.Capita. +
##     temp$six_Family + temp$six_Health..Life.Expectancy. + temp$six_Freedom +
##     temp$six_Trust..Government.Corruption. + temp$six_Generosity)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -1.37493 -0.25956 -0.01616  0.32734  1.17838
##
## Coefficients:
##                                     Estimate Std. Error t value
## (Intercept)                           2.1235     0.1583  13.414
## temp$six_Economy..GDP.per.Capita.     0.8175     0.2177   3.755
## temp$six_Family                       1.2853     0.2285   5.625
## temp$six_Health..Life.Expectancy.     1.4278     0.3439   4.152
## temp$six_Freedom                      1.3321     0.3920   3.399
## temp$six_Trust..Government.Corruption.   0.7035     0.4693   1.499
## temp$six_Generosity                   0.2045     0.3581   0.571
##                                     Pr(>|t|)
## (Intercept)                          < 2e-16 ***
## temp$six_Economy..GDP.per.Capita.    0.000251 ***
## temp$six_Family                      9.35e-08 ***
## temp$six_Health..Life.Expectancy.    5.62e-05 ***
## temp$six_Freedom                     0.000876 ***
## temp$six_Trust..Government.Corruption. 0.136012
## temp$six_Generosity                  0.568787
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.5223 on 144 degrees of freedom
##   (7 observations deleted due to missingness)
## Multiple R-squared:  0.8007, Adjusted R-squared:  0.7924
## F-statistic: 96.44 on 6 and 144 DF,  p-value: < 2.2e-16
```

```
## 2017 Scores

temp=open_happy[26:35]
model=lm(temp$seven_Happiness.Score~temp$seven_Economy..GDP.per.Capita.+temp$seven_Family+temp$seven_Family+temp
$seven_Health..Life.Expectancy.+temp$seven_Freedom+temp$seven_Generosity+temp$seven_Trust..Government.Corruptio
n.)
summary(model)
```

```
##
## Call:
## lm(formula = temp$seven_Happiness.Score ~ temp$seven_Economy..GDP.per.Capita. +
##     temp$seven_Family + temp$seven_Family + temp$seven_Health..Life.Expectancy. +
##     temp$seven_Freedom + temp$seven_Generosity + temp$seven_Trust..Government.Corruption.)
##
## Residuals:
##     Min      1Q  Median      3Q     Max
## -1.4989 -0.2367 -0.0330  0.2573  1.1182
##
## Coefficients:
##                                       Estimate Std. Error t value
## (Intercept)                             1.6826     0.1846   9.115
## temp$seven_Economy..GDP.per.Capita.     0.8630     0.2007   4.301
## temp$seven_Family                       1.1193     0.1965   5.695
## temp$seven_Health..Life.Expectancy.     1.3353     0.3140   4.252
## temp$seven_Freedom                      1.3225     0.3410   3.878
## temp$seven_Generosity                   0.4519     0.3213   1.406
## temp$seven_Trust..Government.Corruption.   0.7838     0.4778   1.640
##                                       Pr(>|t|)
## (Intercept)                           6.79e-16 ***
## temp$seven_Economy..GDP.per.Capita.   3.15e-05 ***
## temp$seven_Family                     6.83e-08 ***
## temp$seven_Health..Life.Expectancy.   3.82e-05 ***
## temp$seven_Freedom                     0.00016 ***
## temp$seven_Generosity                  0.16184
## temp$seven_Trust..Government.Corruption.  0.10315
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.4814 on 142 degrees of freedom
##   (9 observations deleted due to missingness)
## Multiple R-squared:  0.8284, Adjusted R-squared:  0.8212
## F-statistic: 114.3 on 6 and 142 DF,  p-value: < 2.2e-16
```

# Model

# GDP Per Capita Prediction for the Year 2018 - For Top Country in 2017

```
top_Country = as.character(happiness2017[1,1])
top_Country
```

```
## [1] "Norway"
```

```
#Predict the GDP Per Capita for the next 30 days for that Country.
# Have predicted for Jan 2018 to show the next 30 days for that Country
## Model

happiness_top_Country_2015 = cbind("2015-01-01",happiness2015%>%
                filter(Country == top_Country)%>%
                select(fif_Economy..GDP.per.Capita.))
colnames(happiness_top_Country_2015) = c('year','gdp')
happiness_top_Country_2016 = cbind("2016-01-01",happiness2016%>%
                filter(Country == top_Country)%>%
                select(six_Economy..GDP.per.Capita.))
colnames(happiness_top_Country_2016) = c('year','gdp')
happiness_top_Country_2017 = cbind("2017-01-01",happiness2017%>%
                filter(Country == top_Country)%>%
                select(seven_Economy..GDP.per.Capita.))
colnames(happiness_top_Country_2017) = c('year','gdp')
happiness_top_Country = rbind(happiness_top_Country_2015,happiness_top_Country_2016,happiness_top_Country_2017)
happiness_top_Country$year = as.Date(happiness_top_Country$year )

View(happiness_top_Country)

library (prophet)
```

```
## Warning: package 'prophet' was built under R version 3.4.1
```

```
## Loading required package: Rcpp
```

```
## Warning: package 'Rcpp' was built under R version 3.4.1
```

```
colnames(happiness_top_Country) = c('ds','y')
m <- prophet(happiness_top_Country)
```

```
## Disabling weekly seasonality. Run prophet with weekly.seasonality=TRUE to override this.
```

```
## Disabling daily seasonality. Run prophet with daily.seasonality=TRUE to override this.
```

```
## n.changepoints greater than number of observations. Using 1
```

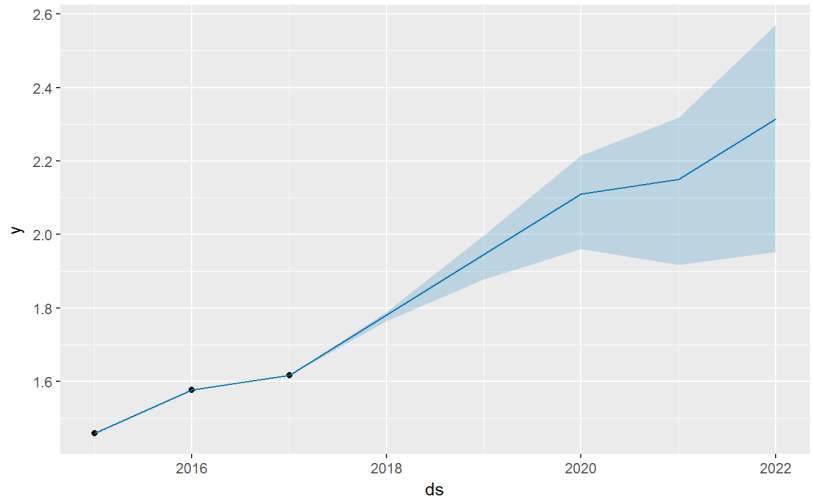
```
## Initial log joint probability = -2.01679
## Optimization terminated with error:
##   Line search failed to achieve a sufficient decrease, no more progress can be made
```

```
## Warning in .local(object, ...): non-zero return code in optimizing
```

```
future = make_future_dataframe(m, period =5, freq="year")
forecast = predict(m, future)
head(forecast)
```

```
##           ds    trend  seasonal seasonal_lower seasonal_upper
## 1 2015-01-01 1.164164 0.2948360      0.2948360      0.2948360
## 2 2016-01-01 1.251281 0.3261594      0.3261594      0.3261594
## 3 2017-01-01 1.384876 0.2315869      0.2315869      0.2315869
## 4 2018-01-01 1.518107 0.2632991      0.2632991      0.2632991
## 5 2019-01-01 1.651338 0.2948360      0.2948360      0.2948360
## 6 2020-01-01 1.784568 0.3261594      0.3261594      0.3261594
##   seasonalities seasonalities_lower seasonalities_upper    yearly
## 1     0.2948360           0.2948360           0.2948360 0.2948360
## 2     0.3261594           0.3261594           0.3261594 0.3261594
## 3     0.2315869           0.2315869           0.2315869 0.2315869
## 4     0.2632991           0.2632991           0.2632991 0.2632991
## 5     0.2948360           0.2948360           0.2948360 0.2948360
## 6     0.3261594           0.3261594           0.3261594 0.3261594
##   yearly_lower yearly_upper yhat_lower yhat_upper trend_lower trend_upper
## 1    0.2948360    0.2948360   1.459000   1.459000    1.164164    1.164164
## 2    0.3261594    0.3261594   1.577440   1.577440    1.251281    1.251281
## 3    0.2315869    0.2315869   1.616463   1.616463    1.384876    1.384876
## 4    0.2632991    0.2632991   1.765016   1.790302    1.501717    1.527003
## 5    0.2948360    0.2948360   1.877611   1.996905    1.582775    1.702069
## 6    0.3261594    0.3261594   1.961587   2.215846    1.635427    1.889686
##       yhat
## 1 1.459000
## 2 1.577440
## 3 1.616463
## 4 1.781406
## 5 1.946174
## 6 2.110728
```

```
plot(m, forecast)
```



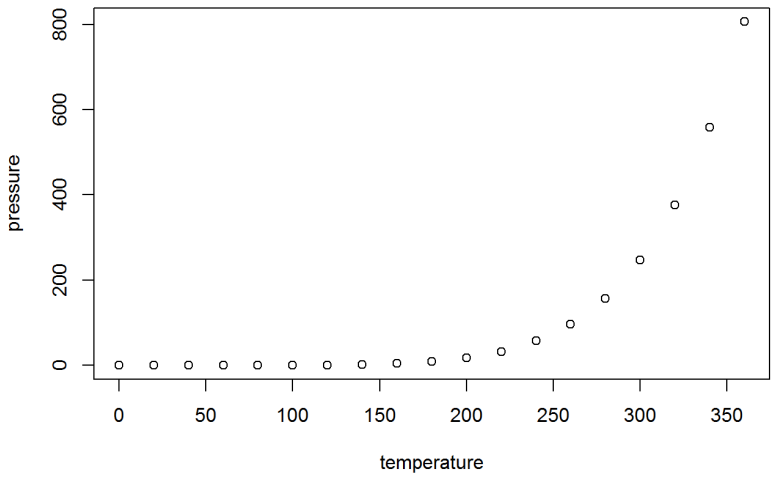

```

# R Markdown

This is an R Markdown document. Markdown is a simple formatting syntax for authoring HTML, PDF, and MS Word documents. For more details on using R Markdown see http://rmarkdown.rstudio.com (http://rmarkdown.rstudio.com).

When you click the **Knit** button a document will be generated that includes both content as well as the output of any embedded R code chunks within the document. You can embed an R code chunk like this: ## Including Plots

You can also embed plots, for example:




Note that the `echo = FALSE` parameter was added to the code chunk to prevent printing of the R code that generated the plot.
```