In [1]: ```python
import pandas as pd
```

In [2]: ```python
data = pd.read_csv("2015.csv")
```

Out[2]:

| | Country | Region | Happiness Rank | Happiness Score | Standard Error | Economy (GDP per Capita) | Family | Health (Life Expectancy) | Fre |
|---|---|---|---|---|---|---|---|---|---|
| 0 | Switzerland | Western Europe | 1 | 7.587 | 0.03411 | 1.39651 | 1.34951 | 0.94143 | 0. |
| 1 | Iceland | Western Europe | 2 | 7.561 | 0.04884 | 1.30232 | 1.40223 | 0.94784 | 0. |
| 2 | Denmark | Western Europe | 3 | 7.527 | 0.03328 | 1.32548 | 1.36058 | 0.87464 | 0. |
| 3 | Norway | Western Europe | 4 | 7.522 | 0.03880 | 1.45900 | 1.33095 | 0.88521 | 0. |
| 4 | Canada | North America | 5 | 7.427 | 0.03553 | 1.32629 | 1.32261 | 0.90563 | 0. |
| ... | ... | ... | ... | ... | ... | ... | ... | ... | |
| 153 | Rwanda | Sub-Saharan Africa | 154 | 3.465 | 0.03464 | 0.22208 | 0.77370 | 0.42864 | 0. |
| 154 | Benin | Sub-Saharan Africa | 155 | 3.340 | 0.03656 | 0.28665 | 0.35386 | 0.31910 | 0. |
| 155 | Syria | Middle East and Northern Africa | 156 | 3.006 | 0.05015 | 0.66320 | 0.47489 | 0.72193 | 0. |
| 156 | Burundi | Sub-Saharan Africa | 157 | 2.905 | 0.08658 | 0.01530 | 0.41587 | 0.22396 | 0. |
| 157 | Togo | Sub-Saharan Africa | 158 | 2.839 | 0.06727 | 0.20868 | 0.13995 | 0.28443 | 0. |

158 rows × 12 columns

# a) Find mean, median, mode and describe

In [3]:

Out[3]: 
```
Happiness Rank                    79.493671
Happiness Score                    5.375734
Standard Error                     0.047885
Economy (GDP per Capita)           0.846137
Family                             0.991046
Health (Life Expectancy)           0.630259
Freedom                            0.428615
Trust (Government Corruption)      0.143422
Generosity                         0.237296
Dystopia Residual                  2.098977
dtype: float64
```

In [4]:

Out[4]: 
```
Happiness Rank                    79.500000
Happiness Score                    5.232500
Standard Error                     0.043940
Economy (GDP per Capita)           0.910245
Family                             1.029510
Health (Life Expectancy)           0.696705
Freedom                            0.435515
Trust (Government Corruption)      0.107220
Generosity                         0.216130
Dystopia Residual                  2.095415
dtype: float64
```

In [5]:

Out[5]:

| | Country | Region | Happiness Rank | Happiness Score | Standard Error | Economy (GDP per Capita) | Family | Health (Life Expectancy) | Fre |
|---|---|---|---|---|---|---|---|---|---|
| 0 | Afghanistan | Sub-Saharan Africa | 82.0 | 5.192 | 0.03751 | 0.00000 | 0.00000 | 0.92356 | 0. |
| 1 | Albania | NaN | NaN | NaN | 0.03780 | 0.01530 | 0.13995 | NaN | 0. |
| 2 | Algeria | NaN | NaN | NaN | 0.04394 | 0.01604 | 0.30285 | NaN | 0. |
| 3 | Angola | NaN | NaN | NaN | 0.04934 | 0.06940 | 0.35386 | NaN | 0. |
| 4 | Argentina | NaN | NaN | NaN | 0.05051 | 0.07120 | 0.38174 | NaN | 0. |
| ... | ... | ... | ... | ... | ... | ... | ... | ... | |
| 153 | Venezuela | NaN | NaN | NaN | NaN | 1.45900 | 1.34043 | NaN | 0. |
| 154 | Vietnam | NaN | NaN | NaN | NaN | 1.52186 | 1.34951 | NaN | 0. |
| 155 | Yemen | NaN | NaN | NaN | NaN | 1.55422 | 1.36058 | NaN | 0. |
| 156 | Zambia | NaN | NaN | NaN | NaN | 1.56391 | 1.36948 | NaN | 0. |
| 157 | Zimbabwe | NaN | NaN | NaN | NaN | 1.69042 | 1.40223 | NaN | 0. |

158 rows × 12 columns

In [6]:

Out[6]:

| | Happiness Rank | Happiness Score | Standard Error | Economy (GDP per Capita) | Family | Health (Life Expectancy) | Freedom | (G C |
|---|---|---|---|---|---|---|---|---|
| count | 158.000000 | 158.000000 | 158.000000 | 158.000000 | 158.000000 | 158.000000 | 158.000000 | 1 |
| mean | 79.493671 | 5.375734 | 0.047885 | 0.846137 | 0.991046 | 0.630259 | 0.428615 | |
| std | 45.754363 | 1.145010 | 0.017146 | 0.403121 | 0.272369 | 0.247078 | 0.150693 | |
| min | 1.000000 | 2.839000 | 0.018480 | 0.000000 | 0.000000 | 0.000000 | 0.000000 | |
| 25% | 40.250000 | 4.526000 | 0.037268 | 0.545808 | 0.856823 | 0.439185 | 0.328330 | |
| 50% | 79.500000 | 5.232500 | 0.043940 | 0.910245 | 1.029510 | 0.696705 | 0.435515 | |
| 75% | 118.750000 | 6.243750 | 0.052300 | 1.158448 | 1.214405 | 0.811013 | 0.549092 | |
| max | 158.000000 | 7.587000 | 0.136930 | 1.690420 | 1.402230 | 1.025250 | 0.669730 | |

# Find sum(), cumsum(), count, min and max values

In [7]:

Out[7]: Country                         SwitzerlandIcelandDenmarkNorwayCanadaFinland
        Ne...
        Region                          Western EuropeWestern EuropeWestern EuropeWe
        st...
        Happiness Rank
        12560
        Happiness Score                                                           84
        9.366
        Standard Error                                                            7.
        56579
        Economy (GDP per Capita)                                                133.
        68968
        Family                                                                  156.
        58526
        Health (Life Expectancy)                                                 99.
        58098
        Freedom                                                                  67.
        72116
        Trust (Government Corruption)                                            22.
        66065
        Generosity                                                               37.
        49269
        Dystopia Residual                                                       331.
        63833
        dtype: object

In [8]:

Out[8]:

| | Country | Region | Happiness Rank | Happiness Score | Sta |
|---|---|---|---|---|---|
| 0 | Switzerland | Western Europe | 1 | 7.587 | ( |
| 1 | SwitzerlandIceland | Western EuropeWestern Europe | 3 | 15.148 | ( |
| 2 | SwitzerlandIcelandDenmark | Western EuropeWestern EuropeWestern Europe | 6 | 22.675 | ( |
| 3 | SwitzerlandIcelandDenmarkNorway | Western EuropeWestern EuropeWestern EuropeWest... | 10 | 30.197 | ( |
| 4 | SwitzerlandIcelandDenmarkNorwayCanada | Western EuropeWestern | 15 | 37.624 | ( |

In [9]:

Out[9]:
```
Country                          158
Region                           158
Happiness Rank                   158
Happiness Score                  158
Standard Error                   158
Economy (GDP per Capita)         158
Family                           158
Health (Life Expectancy)         158
Freedom                          158
Trust (Government Corruption)     158
Generosity                       158
Dystopia Residual                158
dtype: int64
```

In [10]:

Out[10]:
```
Country                           Zimbabwe
Region                      Western Europe
Happiness Rank                         158
Happiness Score                      7.587
Standard Error                     0.13693
Economy (GDP per Capita)           1.69042
Family                             1.40223
Health (Life Expectancy)           1.02525
Freedom                            0.66973
Trust (Government Corruption)      0.55191
Generosity                         0.79588
Dystopia Residual                  3.60214
dtype: object
```

```
In [11]:
```

```
Out[11]: Country                                      Afghanistan
         Region                         Australia and New Zealand
         Happiness Rank                                         1
         Happiness Score                                    2.839
         Standard Error                                   0.01848
         Economy (GDP per Capita)                             0.0
         Family                                               0.0
         Health (Life Expectancy)                             0.0
         Freedom                                              0.0
         Trust (Government Corruption)                        0.0
         Generosity                                           0.0
         Dystopia Residual                                0.32858
         dtype: object
```

# Find covariance and correlation (spearman and pearsons

```
In [12]:
```

```
In [13]:
```

```
[[ 2.09346174e+03 -5.19756132e+01]
 [-5.19756132e+01  1.31104821e+00]]
```

```
In [14]: from scipy.stats import pearsonr
```

```
In [15]:
```

```
(-0.9921053148284924, 1.4013759581587442e-142)
```

```
In [16]:
```

```
SpearmanrResult(correlation=-0.9999999999999999, pvalue=0.0)
```