Importing libraries

In [1]:
```
import numpy as np
import pandas as pd
```

In [2]:
```
df=pd.read_csv(r'C:\Users\user\Desktop\2015 dataset.csv')
```

Find mean, median, mode and describe

In [3]:
```
print(df.mean())
```

```
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]:
```
print(df.median())
```

```
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]:
```
print(df.mode())
```

```
       Country              Region  Happiness Rank  Happiness Score  \
0  Afghanistan  Sub-Saharan Africa            82.0            5.192
1      Albania                 NaN             NaN              NaN
2      Algeria                 NaN             NaN              NaN
3       Angola                 NaN             NaN              NaN
4    Argentina                 NaN             NaN              NaN
..         ...                 ...             ...              ...
153  Venezuela                 NaN             NaN              NaN
154    Vietnam                 NaN             NaN              NaN
155      Yemen                 NaN             NaN              NaN
156     Zambia                 NaN             NaN              NaN
157   Zimbabwe                 NaN             NaN              NaN

     Standard Error  Economy (GDP per Capita)   Family  \
0           0.03751                   0.00000  0.00000
1           0.03780                   0.01530  0.13995
2           0.04394                   0.01604  0.30285
3           0.04934                   0.06940  0.35386
4           0.05051                   0.07120  0.38174
..              ...                       ...      ...
153             NaN                   1.45900  1.34043
154             NaN                   1.52186  1.34951
155             NaN                   1.55422  1.36058
156             NaN                   1.56391  1.36948
157             NaN                   1.69042  1.40223

     Health (Life Expectancy)  Freedom  Trust (Government Corruption)  \
0                     0.92356  0.00000                        0.32524
1                         NaN  0.07699                            NaN
2                         NaN  0.09245                            NaN
3                         NaN  0.10081                            NaN
4                         NaN  0.10384                            NaN
..                        ...      ...                            ...
153                       NaN  0.65821                            NaN
154                       NaN  0.65980                            NaN
155                       NaN  0.66246                            NaN
156                       NaN  0.66557                            NaN
157                       NaN  0.66973                            NaN

     Generosity  Dystopia Residual
0       0.00000            0.32858
1       0.00199            0.65429
2       0.02641            0.67042
3       0.05444            0.67108
4       0.05547            0.89991
..          ...                ...
153     0.51535            3.10712
154     0.51752            3.17728
155     0.51912            3.19131
156     0.57630            3.26001
157     0.79588            3.60214

[158 rows x 12 columns]
```

In [6]:
```
print(df.describe())
```

```
       Happiness Rank  Happiness Score  Standard Error  \
count      158.000000       158.000000      158.000000
mean        79.493671         5.375734        0.047885
std         45.754363         1.145010        0.017146
min          1.000000         2.839000        0.018480
25%         40.250000         4.526000        0.037268
50%         79.500000         5.232500        0.043940
75%        118.750000         6.243750        0.052300
max        158.000000         7.587000        0.136930

       Economy (GDP per Capita)      Family  Health (Life Expectancy)  \
count                158.000000  158.000000                158.000000
mean                   0.846137    0.991046                  0.630259
std                    0.403121    0.272369                  0.247078
min                    0.000000    0.000000                  0.000000
25%                    0.545808    0.856823                  0.439185
50%                    0.910245    1.029510                  0.696705
75%                    1.158448    1.214405                  0.811013
max                    1.690420    1.402230                  1.025250

          Freedom  Trust (Government Corruption)  Generosity  \
count  158.000000                     158.000000  158.000000
mean     0.428615                       0.143422    0.237296
std      0.150693                       0.120034    0.126685
min      0.000000                       0.000000    0.000000
25%      0.328330                       0.061675    0.150553
50%      0.435515                       0.107220    0.216130
75%      0.549092                       0.180255    0.309883
max      0.669730                       0.551910    0.795880

       Dystopia Residual
count         158.000000
mean            2.098977
std             0.553550
min             0.328580
25%             1.759410
50%             2.095415
75%             2.462415
max             3.602140
```

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

In [7]:
```
print(df.sum())
```

```
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]:
```
print(df.cumsum())
```

```
                                                Country  \
0                                           Switzerland
1                                    SwitzerlandIceland
2                             SwitzerlandIcelandDenmark
3                      SwitzerlandIcelandDenmarkNorway
4                 SwitzerlandIcelandDenmarkNorwayCanada
..                                                  ...
153  SwitzerlandIcelandDenmarkNorwayCanadaFinlandNe...
154  SwitzerlandIcelandDenmarkNorwayCanadaFinlandNe...
155  SwitzerlandIcelandDenmarkNorwayCanadaFinlandNe...
156  SwitzerlandIcelandDenmarkNorwayCanadaFinlandNe...
157  SwitzerlandIcelandDenmarkNorwayCanadaFinlandNe...

                                              Region  Happiness Rank  \
0                                     Western Europe               1
1                         Western EuropeWestern Europe               3
2            Western EuropeWestern EuropeWestern Europe               6
3    Western EuropeWestern EuropeWestern EuropeWest...              10
4    Western EuropeWestern EuropeWestern EuropeWest...              15
..                                                 ...             ...
153  Western EuropeWestern EuropeWestern EuropeWest...           11934
154  Western EuropeWestern EuropeWestern EuropeWest...           12089
155  Western EuropeWestern EuropeWestern EuropeWest...           12245
156  Western EuropeWestern EuropeWestern EuropeWest...           12402
157  Western EuropeWestern EuropeWestern EuropeWest...           12560

     Happiness Score  Standard Error  Economy (GDP per Capita)     Family  \
0              7.587         0.03411                   1.39651    1.34951
1             15.148         0.08295                   2.69883    2.75174
2             22.675         0.11623                   4.02431    4.11232
3             30.197         0.15503                   5.48331    5.44327
4             37.624         0.19056                   6.80960    6.76588
..               ...             ...                       ...        ...
153          837.276         7.32523                132.51585  155.20069
154          840.616         7.36179                132.80250  155.55455
155          843.622         7.41194                133.46570  156.02944
156          846.527         7.49852                133.48100  156.44531
157          849.366         7.56579                133.68968  156.58526

     Health (Life Expectancy)   Freedom  Trust (Government Corruption)  \
0                     0.94143   0.66557                        0.41978
1                     1.88927   1.29434                        0.56123
2                     2.76391   1.94372                        1.04480
3                     3.64912   2.61345                        1.40983
4                     4.55475   3.24642                        1.73940
..                        ...       ...                            ...
153                  98.03156  66.59679                       22.18356
154                  98.35066  67.08129                       22.26366
155                  99.07259  67.23813                       22.45272
156                  99.29655  67.35663                       22.55334
157                  99.58098  67.72116                       22.66065

     Generosity  Dystopia Residual
0       0.29678            2.51738
1       0.73308            5.21939
2       1.07447            7.71143
3       1.42146           10.17674
```

```
4       1.87957          12.62850
..          ...               ...
153    36.47422         326.27619
154    36.65682         327.90947
155    37.12861         328.23805
156    37.32588         330.07107
157    37.49269         331.63833

[158 rows x 12 columns]
```

In [9]:
```
print(df.count())
```

```
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]:
```
print(df.min())
```

```
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
```

In [11]:
```
print(df.max())
```

```
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
```

c) Find covariance and correlation (spearman and pearsons)

In [12]:
```
from numpy import cov
```

In [13]:
```
cov(df['Health (Life Expectancy)'],df['Freedom'])
```

Out[13]:
```
array([[0.06104742, 0.01342156],
       [0.01342156, 0.02270832]])
```

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

In [15]:
```
spearmanr(df['Health (Life Expectancy)'],df['Freedom'])
```

Out[15]:
```
SpearmanrResult(correlation=0.3998001090730188, pvalue=1.9482755643851214e-07)
```

In [ ]:
```

```