

mk 25-07-23

```
In [62]: import numpy as np
import pandas as pd
```

```
In [63]: a=pd.read_csv(r"C:\Users\user\Downloads\2_2015.csv")
a
```

Out[63]:

	Country	Region	Happiness Rank	Happiness Score	Standard Error	Economy (GDP per Capita)	Family	Health (Life Expectancy)	Frei
0	Switzerland	Western Europe	1	7.587	0.03411	1.39651	1.34951	0.94143	0.6
1	Iceland	Western Europe	2	7.561	0.04884	1.30232	1.40223	0.94784	0.6
2	Denmark	Western Europe	3	7.527	0.03328	1.32548	1.36058	0.87464	0.6
3	Norway	Western Europe	4	7.522	0.03880	1.45900	1.33095	0.88521	0.6
4	Canada	North America	5	7.427	0.03553	1.32629	1.32261	0.90563	0.6
...
153	Rwanda	Sub-Saharan Africa	154	3.465	0.03464	0.22208	0.77370	0.42864	0.5
154	Benin	Sub-Saharan Africa	155	3.340	0.03656	0.28665	0.35386	0.31910	0.4
155	Syria	Middle East and Northern Africa	156	3.006	0.05015	0.66320	0.47489	0.72193	0.1
156	Burundi	Sub-Saharan Africa	157	2.905	0.08658	0.01530	0.41587	0.22396	0.1
157	Togo	Sub-Saharan Africa	158	2.839	0.06727	0.20868	0.13995	0.28443	0.3

158 rows × 12 columns



```
In [64]: a=a.head(50)
```

In [65]: a.sum()

```
Out[65]: Country                SwitzerlandIcelandDenmarkNorwayCanadaFinland
Ne...
Region                Western EuropeWestern EuropeWestern EuropeWe
st...
Happiness Rank
1275
Happiness Score                33
6.452
Standard Error                2.
17922
Economy (GDP per Capita)        60.
88761
Family                60.
61385
Health (Life Expectancy)        4
1.7701
Freedom                27.
17041
Trust (Government Corruption)    11.
08659
Generosity                13.
65113
Dystopia Residual                121.
27431
dtype: object
```

In [66]: a.mean()

```
Out[66]: Happiness Rank        25.500000
Happiness Score        6.729040
Standard Error        0.043584
Economy (GDP per Capita)    1.217752
Family        1.212277
Health (Life Expectancy)    0.835402
Freedom        0.543408
Trust (Government Corruption)    0.221732
Generosity        0.273023
Dystopia Residual        2.425486
dtype: float64
```

```
In [67]: a.median()
```

```
Out[67]: Happiness Rank      25.500000  
Happiness Score             6.768000  
Standard Error              0.040795  
Economy (GDP per Capita)    1.268555  
Family                      1.243645  
Health (Life Expectancy)    0.868215  
Freedom                     0.568085  
Trust (Government Corruption) 0.196610  
Generosity                  0.254365  
Dystopia Residual            2.426780  
dtype: float64
```

In [68]: `a.mode()`

Out[68]:

	Country	Region	Happiness Rank	Happiness Score	Standard Error	Economy (GDP per Capita)	Family	Health (Life Expectancy)	Free
0	Argentina	Western Europe	1	5.948	0.01848	0.63244	0.91451	0.59772	0.2
1	Australia	NaN	2	5.960	0.01866	0.74553	0.95774	0.60820	0.3
2	Austria	NaN	3	5.975	0.02799	0.76454	0.97200	0.61483	0.3
3	Bahrain	NaN	4	5.984	0.03140	0.86402	0.99903	0.64425	0.3
4	Belgium	NaN	5	5.987	0.03157	0.91861	1.02000	0.67737	0.3
5	Brazil	NaN	6	5.995	0.03328	0.95578	1.02507	0.69077	0.4
6	Canada	NaN	7	6.003	0.03371	0.96690	1.04356	0.69702	0.4
7	Chile	NaN	8	6.123	0.03411	0.98124	1.07617	0.72025	0.4
8	Colombia	NaN	9	6.130	0.03468	0.99534	1.07860	0.72052	0.4
9	Costa Rica	NaN	10	6.168	0.03470	1.02054	1.08182	0.72492	0.4
10	Czech Republic	NaN	11	6.269	0.03499	1.04424	1.08393	0.73850	0.4
11	Denmark	NaN	12	6.295	0.03512	1.05351	1.12447	0.74716	0.4
12	Ecuador	NaN	13	6.298	0.03553	1.06166	1.12575	0.76276	0.4
13	El Salvador	NaN	14	6.302	0.03557	1.06353	1.16594	0.78723	0.4
14	Finland	NaN	15	6.329	0.03581	1.10715	1.18354	0.78902	0.4
15	France	NaN	16	6.411	0.03595	1.16891	1.19777	0.79075	0.4
16	Germany	NaN	17	6.455	0.03676	1.17898	1.19850	0.79661	0.4
17	Guatemala	NaN	18	6.477	0.03729	1.20740	1.20643	0.79733	0.5
18	Iceland	NaN	19	6.485	0.03751	1.21183	1.20890	0.80925	0.5
19	Ireland	NaN	20	6.505	0.03780	1.22857	1.21624	0.81160	0.5
20	Israel	NaN	21	6.574	0.03839	1.23011	1.21963	0.81444	0.5
21	Italy	NaN	22	6.575	0.03868	1.24461	1.22393	0.84483	0.5
22	Japan	NaN	23	6.611	0.03880	1.25018	1.23287	0.85857	0.5
23	Kuwait	NaN	24	6.670	0.03914	1.25114	1.23788	0.86027	0.5
24	Luxembourg	NaN	25	6.750	0.04076	1.26637	1.24018	0.86179	0.5
25	Malta	NaN	26	6.786	0.04083	1.27074	1.24711	0.87464	0.5
26	Mexico	NaN	27	6.798	0.04098	1.27778	1.24823	0.87530	0.5
27	Netherlands	NaN	28	6.810	0.04168	1.29025	1.25596	0.88521	0.5
28	New Zealand	NaN	29	6.853	0.04176	1.29098	1.25712	0.88721	0.5
29	Norway	NaN	30	6.867	0.04206	1.30232	1.26038	0.88911	0.6
30	Oman	NaN	31	6.901	0.04267	1.30782	1.26504	0.89042	0.6
31	Panama	NaN	32	6.937	0.04361	1.32376	1.26999	0.89186	0.6
32	Qatar	NaN	33	6.940	0.04454	1.32548	1.28017	0.89284	0.6

	Country	Region	Happiness Rank	Happiness Score	Standard Error	Economy (GDP per Capita)	Family	Health (Life Expectancy)	Free
33	Saudi Arabia	NaN	34	6.946	0.04456	1.32629	1.28548	0.89533	0.6
34	Singapore	NaN	35	6.983	0.04528	1.32792	1.28566	0.89667	0.6
35	Slovakia	NaN	36	7.119	0.04539	1.32944	1.28907	0.90563	0.6
36	South Korea	NaN	37	7.187	0.04612	1.33171	1.29704	0.90837	0.6
37	Spain	NaN	38	7.200	0.04633	1.33358	1.29937	0.90943	0.6
38	Suriname	NaN	39	7.226	0.04884	1.33596	1.30203	0.91087	0.6
39	Sweden	NaN	40	7.278	0.04910	1.33723	1.30923	0.91387	0.6
40	Switzerland	NaN	41	7.284	0.05051	1.36011	1.31379	0.91894	0.6
41	Taiwan	NaN	42	7.286	0.05224	1.39451	1.31826	0.93156	0.6
42	Thailand	NaN	43	7.364	0.05335	1.39541	1.31967	0.94143	0.6
43	Trinidad and Tobago	NaN	44	7.378	0.05412	1.39651	1.32261	0.94579	0.6
44	United Arab Emirates	NaN	45	7.406	0.05618	1.42727	1.33095	0.94784	0.6
45	United Kingdom	NaN	46	7.427	0.05800	1.45900	1.34043	0.95446	0.6
46	United States	NaN	47	7.522	0.06257	1.52186	1.34951	0.95562	0.6
47	Uruguay	NaN	48	7.527	0.06476	1.55422	1.36058	0.96538	0.6
48	Uzbekistan	NaN	49	7.561	0.09811	1.56391	1.36948	0.99111	0.6
49	Venezuela	NaN	50	7.587	0.10895	1.69042	1.40223	1.02525	0.6

In [69]: a.describe()

Out[69]:

	Happiness Rank	Happiness Score	Standard Error	Economy (GDP per Capita)	Family	Health (Life Expectancy)	Freedom	T (Governn Corrupt
count	50.00000	50.000000	50.000000	50.000000	50.000000	50.000000	50.000000	50.000000
mean	25.50000	6.729040	0.043584	1.217752	1.212277	0.835402	0.543408	0.227000
std	14.57738	0.511449	0.015482	0.216687	0.118959	0.105584	0.105589	0.142000
min	1.00000	5.948000	0.018480	0.632440	0.914510	0.597720	0.262360	0.010000
25%	13.25000	6.299000	0.035540	1.062128	1.135798	0.768877	0.468183	0.090000
50%	25.50000	6.768000	0.040795	1.268555	1.243645	0.868215	0.568085	0.190000
75%	37.75000	7.196750	0.046277	1.333112	1.298787	0.909165	0.631748	0.320000
max	50.00000	7.587000	0.108950	1.690420	1.402230	1.025250	0.669730	0.520000

```
In [70]: a.cumsum()
```

44	SwitzerlandIcelandDenmarkNorwayCanadaFinlandNe...	EuropeWestern EuropeWestern EuropeWest...	1035	306.598	▲
45	SwitzerlandIcelandDenmarkNorwayCanadaFinlandNe...	Western EuropeWestern EuropeWestern EuropeWest...	1081	312.585	
46	SwitzerlandIcelandDenmarkNorwayCanadaFinlandNe...	Western EuropeWestern EuropeWestern EuropeWest...	1128	318.569	
47	SwitzerlandIcelandDenmarkNorwayCanadaFinlandNe...	Western EuropeWestern EuropeWestern EuropeWest...	1176	324.544	
48	SwitzerlandIcelandDenmarkNorwayCanadaFinlandNe...	Western EuropeWestern EuropeWestern EuropeWest...	1225	330.504	▼

```
In [71]: a.count()
```

Out[71]:	Country	50
	Region	50
	Happiness Rank	50
	Happiness Score	50
	Standard Error	50
	Economy (GDP per Capita)	50
	Family	50
	Health (Life Expectancy)	50
	Freedom	50
	Trust (Government Corruption)	50
	Generosity	50
	Dystopia Residual	50
	dtype:	int64

```
In [72]: a.min()
```

Out[72]:	Country	Argentina
	Region	Australia and New Zealand
	Happiness Rank	1
	Happiness Score	5.948
	Standard Error	0.01848
	Economy (GDP per Capita)	0.63244
	Family	0.91451
	Health (Life Expectancy)	0.59772
	Freedom	0.26236
	Trust (Government Corruption)	0.0114
	Generosity	0.05841
	Dystopia Residual	1.55674
	dtype:	object

```
In [73]: a.max()
```

```
Out[73]: Country                Venezuela  
Region                Western Europe  
Happiness Rank                50  
Happiness Score                7.587  
Standard Error                0.10895  
Economy (GDP per Capita)        1.69042  
Family                    1.40223  
Health (Life Expectancy)        1.02525  
Freedom                    0.66973  
Trust (Government Corruption)    0.52208  
Generosity                0.5763  
Dystopia Residual                3.60214  
dtype: object
```

```
In [74]: from numpy import cov
```

```
In [75]: cov(a['Happiness Rank'])
```

```
Out[75]: array(212.5)
```

```
In [76]: from scipy.stats import pearsonr  
pearsonr(a['Family'],a['Freedom'])
```

```
Out[76]: (0.42304787321510523, 0.002206977459208018)
```

```
In [77]: from scipy.stats import spearmanr  
spearmanr(a['Freedom'],a['Family'])
```

```
Out[77]: SpearmanrResult(correlation=0.5541896758703482, pvalue=2.9735324226055305e-05)
```

```
In [ ]:
```