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

In [2]:
```
rawdata=pd.read_csv('world-happiness-report.csv')
```

In [3]:
```
rawdata
```

Out[3]:

	Country	year	Life Ladder	Log GDP	Social support	life expectancy	life choices	Generosity	Perceptions of corruption	Positive affect	Negative affect
0	Afghanistan	2008	3.724	7.370	0.451	50.80	0.718	0.168	0.882	0.518	0.258
1	Afghanistan	2009	4.402	7.540	0.552	51.20	0.679	0.190	0.850	0.584	0.237
2	Afghanistan	2010	4.758	7.647	0.539	51.60	0.600	0.121	0.707	0.618	0.275
3	Afghanistan	2011	3.832	7.620	0.521	51.92	0.496	0.162	0.731	0.611	0.267
4	Afghanistan	2012	3.783	7.705	0.521	52.24	0.531	0.236	0.776	0.710	0.268
...	...	...	...	...	...	...	...	...	...	...	...
94	Azerbaijan	2007	4.568	9.386	0.753	62.26	0.522	-0.207	0.871	0.521	0.284
95	Azerbaijan	2008	4.817	9.465	0.684	62.64	0.601	-0.029	0.715	0.578	0.227
96	Azerbaijan	2009	4.574	9.534	0.736	63.02	0.498	-0.087	0.754	0.544	0.234
97	Azerbaijan	2010	4.219	9.569	0.687	63.40	0.501	-0.123	0.858	0.527	0.272
98	Azerbaijan	2011	4.680	9.540	0.725	63.64	0.537	-0.105	0.795	0.536	0.258

99 rows × 11 columns

In [4]:
```
df=rawdata.describe()
```

In [5]:
```
df
```

Out[5]:

	year	Life Ladder	Log GDP	Social support	life expectancy	life choices	Generosity	Perceptions of corruption	Positive affect	Negative affect
count	99.000000	99.000000	99.000000	98.000000	99.000000	97.000000	96.000000	97.000000	98.000000	98.000000
mean	2013.080808	5.562768	9.630919	0.789816	65.783838	0.693876	-0.022615	0.737258	0.680347	0.288163
std	4.059951	1.351619	0.977365	0.145652	6.549259	0.182850	0.177591	0.177213	0.125811	0.087084
min	2005.000000	2.375000	7.370000	0.420000	50.800000	0.374000	-0.251000	0.357000	0.351000	0.145000
25%	2010.000000	4.482000	9.259000	0.699750	64.810000	0.525000	-0.170500	0.614000	0.579500	0.221250
50%	2013.000000	5.464000	9.476000	0.808500	66.960000	0.718000	-0.101500	0.817000	0.672000	0.272500
75%	2016.500000	7.062000	10.711000	0.924750	71.240000	0.889000	0.118750	0.876000	0.806250	0.341250
max	2020.000000	7.499000	10.939000	0.968000	74.200000	0.945000	0.369000	0.954000	0.864000	0.502000

In [6]:
```
dn=np.array([rawdata])
```

In [7]:
```
dn
```

Out[7]:
```
array([[['Afghanistan', 2008, 3.724, ..., 0.882, 0.518, 0.258],
        ['Afghanistan', 2009, 4.402, ..., 0.85, 0.584, 0.237],
        ['Afghanistan', 2010, 4.758, ..., 0.707, 0.618, 0.275],
        ...,
        ['Azerbaijan', 2009, 4.574, ..., 0.754, 0.544, 0.234],
        ['Azerbaijan', 2010, 4.219, ..., 0.858, 0.527, 0.272],
        ['Azerbaijan', 2011, 4.68, ..., 0.795, 0.536, 0.258]]],
      dtype=object)
```

In [8]:
```
dn = np.array(df)
```

In [9]:
```
dn
```

Out[9]:
```
array([[ 9.90000000e+01,  9.90000000e+01,  9.90000000e+01,
         9.80000000e+01,  9.90000000e+01,  9.70000000e+01,
         9.60000000e+01,  9.70000000e+01,  9.80000000e+01,
         9.80000000e+01],
```

```
       [ 2.01308081e+03,  5.56276768e+00,  9.63091919e+00,
         7.89816327e-01,  6.57838384e+01,  6.93876289e-01,
        -2.26145833e-02,  7.37257732e-01,  6.80346939e-01,
         2.88163265e-01],
       [ 4.05995066e+00,  1.35161944e+00,  9.77365249e-01,
         1.45652202e-01,  6.54925930e+00,  1.82850022e-01,
         1.77591273e-01,  1.77213282e-01,  1.25810535e-01,
         8.70837604e-02],
       [ 2.00500000e+03,  2.37500000e+00,  7.37000000e+00,
         4.20000000e-01,  5.08000000e+01,  3.74000000e-01,
        -2.51000000e-01,  3.57000000e-01,  3.51000000e-01,
         1.45000000e-01],
       [ 2.01000000e+03,  4.48200000e+00,  9.25900000e+00,
         6.99750000e-01,  6.48100000e+01,  5.25000000e-01,
        -1.70500000e-01,  6.14000000e-01,  5.79500000e-01,
         2.21250000e-01],
       [ 2.01300000e+03,  5.46400000e+00,  9.47600000e+00,
         8.08500000e-01,  6.69600000e+01,  7.18000000e-01,
        -1.01500000e-01,  8.17000000e-01,  6.72000000e-01,
         2.72500000e-01],
       [ 2.01650000e+03,  7.06200000e+00,  1.07110000e+01,
         9.24750000e-01,  7.12400000e+01,  8.89000000e-01,
         1.18750000e-01,  8.76000000e-01,  8.06250000e-01,
         3.41250000e-01],
       [ 2.02000000e+03,  7.49900000e+00,  1.09390000e+01,
         9.68000000e-01,  7.42000000e+01,  9.45000000e-01,
         3.69000000e-01,  9.54000000e-01,  8.64000000e-01,
         5.02000000e-01]])
```

In [10]:
```
dn=np.array([rawdata.max])
```

In [11]:
```
dn
```

Out[11]:
```
array([<bound method NDFrame._add_numeric_operations.<locals>.max of         Country       year  Life Ladder  Log GDP
Social support  \
       0   Afghanistan       2008        3.724     7.370           0.451
       1   Afghanistan       2009        4.402     7.540           0.552
       2   Afghanistan       2010        4.758     7.647           0.539
       3   Afghanistan       2011        3.832     7.620           0.521
       4   Afghanistan       2012        3.783     7.705           0.521
       ..          ...        ...          ...       ...             ...
       94   Azerbaijan       2007        4.568     9.386           0.753
```

```
95   Azerbaijan       2008        4.817     9.465           0.684
96   Azerbaijan       2009        4.574     9.534           0.736
97   Azerbaijan       2010        4.219     9.569           0.687
98   Azerbaijan       2011        4.680     9.540           0.725

    life expectancy  life choices  Generosity  Perceptions of corruption  \
0             50.80         0.718       0.168                      0.882
1             51.20         0.679       0.190                      0.850
2             51.60         0.600       0.121                      0.707
3             51.92         0.496       0.162                      0.731
4             52.24         0.531       0.236                      0.776
..              ...           ...         ...                        ...
94            62.26         0.522      -0.207                      0.871
95            62.64         0.601      -0.029                      0.715
96            63.02         0.498      -0.087                      0.754
97            63.40         0.501      -0.123                      0.858
98            63.64         0.537      -0.105                      0.795

    Positive affect  Negative affect
0             0.518            0.258
1             0.584            0.237
2             0.618            0.275
3             0.611            0.267
4             0.710            0.268
..              ...              ...
94            0.521            0.284
95            0.578            0.227
96            0.544            0.234
97            0.527            0.272
98            0.536            0.258

[99 rows x 11 columns]>
],
      dtype=object)
```

In [12]:
```
dn=np.array([rawdata.min])
```

In [13]:
```
dn
```

Out[13]:
```
array([<bound method NDFrame._add_numeric_operations.<locals>.min of         Country       year  Life Ladder  Log GDP
Social support  \
       0   Afghanistan       2008        3.724     7.370           0.451
```

```
1   Afghanistan       2009        4.402     7.540           0.552
2   Afghanistan       2010        4.758     7.647           0.539
3   Afghanistan       2011        3.832     7.620           0.521
4   Afghanistan       2012        3.783     7.705           0.521
..          ...        ...          ...       ...             ...
94   Azerbaijan       2007        4.568     9.386           0.753
95   Azerbaijan       2008        4.817     9.465           0.684
96   Azerbaijan       2009        4.574     9.534           0.736
97   Azerbaijan       2010        4.219     9.569           0.687
98   Azerbaijan       2011        4.680     9.540           0.725

    life expectancy  life choices  Generosity  Perceptions of corruption  \
0             50.80         0.718       0.168                      0.882
1             51.20         0.679       0.190                      0.850
2             51.60         0.600       0.121                      0.707
3             51.92         0.496       0.162                      0.731
4             52.24         0.531       0.236                      0.776
..              ...           ...         ...                        ...
94            62.26         0.522      -0.207                      0.871
95            62.64         0.601      -0.029                      0.715
96            63.02         0.498      -0.087                      0.754
97            63.40         0.501      -0.123                      0.858
98            63.64         0.537      -0.105                      0.795

    Positive affect  Negative affect
0             0.518            0.258
1             0.584            0.237
2             0.618            0.275
3             0.611            0.267
4             0.710            0.268
..              ...              ...
94            0.521            0.284
95            0.578            0.227
96            0.544            0.234
97            0.527            0.272
98            0.536            0.258

[99 rows x 11 columns]>
],
      dtype=object)
```

In [14]:

```
dn=np.array([rawdata.mean])
```

In [15]:
```
dn
```

Out[15]:
```
array([<bound method NDFrame._add_numeric_operations.<locals>.mean of         Country       year  Life Ladder  Log GD
P   Social support  \
       0   Afghanistan       2008        3.724     7.370           0.451
       1   Afghanistan       2009        4.402     7.540           0.552
       2   Afghanistan       2010        4.758     7.647           0.539
       3   Afghanistan       2011        3.832     7.620           0.521
       4   Afghanistan       2012        3.783     7.705           0.521
       ..          ...        ...          ...       ...             ...
       94   Azerbaijan       2007        4.568     9.386           0.753
       95   Azerbaijan       2008        4.817     9.465           0.684
       96   Azerbaijan       2009        4.574     9.534           0.736
       97   Azerbaijan       2010        4.219     9.569           0.687
       98   Azerbaijan       2011        4.680     9.540           0.725

           life expectancy  life choices  Generosity  Perceptions of corruption  \
       0             50.80         0.718       0.168                      0.882
       1             51.20         0.679       0.190                      0.850
       2             51.60         0.600       0.121                      0.707
       3             51.92         0.496       0.162                      0.731
       4             52.24         0.531       0.236                      0.776
       ..              ...           ...         ...                        ...
       94            62.26         0.522      -0.207                      0.871
       95            62.64         0.601      -0.029                      0.715
       96            63.02         0.498      -0.087                      0.754
       97            63.40         0.501      -0.123                      0.858
       98            63.64         0.537      -0.105                      0.795

           Positive affect  Negative affect
       0             0.518            0.258
       1             0.584            0.237
       2             0.618            0.275
       3             0.611            0.267
       4             0.710            0.268
       ..              ...              ...
       94            0.521            0.284
       95            0.578            0.227
       96            0.544            0.234
       97            0.527            0.272
       98            0.536            0.258

       [99 rows x 11 columns]>
```

```
],
      dtype=object)
```

In [16]:
```
dn=np.array([rawdata.median])
```

In [17]:
```
dn
```

Out[17]:
```
array([<bound method NDFrame._add_numeric_operations.<locals>.median of         Country       year  Life Ladder  Log
GDP   Social support  \
       0   Afghanistan       2008        3.724     7.370           0.451
       1   Afghanistan       2009        4.402     7.540           0.552
       2   Afghanistan       2010        4.758     7.647           0.539
       3   Afghanistan       2011        3.832     7.620           0.521
       4   Afghanistan       2012        3.783     7.705           0.521
       ..          ...        ...          ...       ...             ...
       94   Azerbaijan       2007        4.568     9.386           0.753
       95   Azerbaijan       2008        4.817     9.465           0.684
       96   Azerbaijan       2009        4.574     9.534           0.736
       97   Azerbaijan       2010        4.219     9.569           0.687
       98   Azerbaijan       2011        4.680     9.540           0.725

           life expectancy  life choices  Generosity  Perceptions of corruption  \
       0             50.80         0.718       0.168                      0.882
       1             51.20         0.679       0.190                      0.850
       2             51.60         0.600       0.121                      0.707
       3             51.92         0.496       0.162                      0.731
       4             52.24         0.531       0.236                      0.776
       ..              ...           ...         ...                        ...
       94            62.26         0.522      -0.207                      0.871
       95            62.64         0.601      -0.029                      0.715
       96            63.02         0.498      -0.087                      0.754
       97            63.40         0.501      -0.123                      0.858
       98            63.64         0.537      -0.105                      0.795

           Positive affect  Negative affect
       0             0.518            0.258
       1             0.584            0.237
       2             0.618            0.275
       3             0.611            0.267
       4             0.710            0.268
       ..              ...              ...
       94            0.521            0.284
```

```
       95            0.578            0.227
       96            0.544            0.234
       97            0.527            0.272
       98            0.536            0.258

       [99 rows x 11 columns]>
],
      dtype=object)
```

In [18]:
```
dn=np.array([rawdata.var])
```

In [19]:
```
dn
```

Out[19]:
```
array([<bound method NDFrame._add_numeric_operations.<locals>.var of         Country       year  Life Ladder  Log GDP
Social support  \
       0   Afghanistan       2008        3.724     7.370           0.451
       1   Afghanistan       2009        4.402     7.540           0.552
       2   Afghanistan       2010        4.758     7.647           0.539
       3   Afghanistan       2011        3.832     7.620           0.521
       4   Afghanistan       2012        3.783     7.705           0.521
       ..          ...        ...          ...       ...             ...
       94   Azerbaijan       2007        4.568     9.386           0.753
       95   Azerbaijan       2008        4.817     9.465           0.684
       96   Azerbaijan       2009        4.574     9.534           0.736
       97   Azerbaijan       2010        4.219     9.569           0.687
       98   Azerbaijan       2011        4.680     9.540           0.725

           life expectancy  life choices  Generosity  Perceptions of corruption  \
       0             50.80         0.718       0.168                      0.882
       1             51.20         0.679       0.190                      0.850
       2             51.60         0.600       0.121                      0.707
       3             51.92         0.496       0.162                      0.731
       4             52.24         0.531       0.236                      0.776
       ..              ...           ...         ...                        ...
       94            62.26         0.522      -0.207                      0.871
       95            62.64         0.601      -0.029                      0.715
       96            63.02         0.498      -0.087                      0.754
       97            63.40         0.501      -0.123                      0.858
       98            63.64         0.537      -0.105                      0.795

           Positive affect  Negative affect
       0             0.518            0.258
```

```
        1             0.584            0.237
        2             0.618            0.275
        3             0.611            0.267
        4             0.710            0.268
        ..              ...              ...
        94            0.521            0.284
        95            0.578            0.227
        96            0.544            0.234
        97            0.527            0.272
        98            0.536            0.258

        [99 rows x 11 columns]>
],
      dtype=object)
```

In [ ]: