In [1]:

```
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns
```

In [2]:

```
a=pd.read_csv(r"C:\Users\user\Downloads\2015 - 2015.csv")
a
```

Out[2]:

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

158 rows × 12 columns

In [3]:

```
b=a.head(100)
b
```

Out[3]:

	Country	Region	Happiness Rank	Happiness Score	Standard Error	Economy (GDP per Capita)	Family	Health (L Expectanc
0	Switzerland	Western Europe	1	7.587	0.03411	1.39651	1.34951	0.941
1	Iceland	Western Europe	2	7.561	0.04884	1.30232	1.40223	0.947
2	Denmark	Western Europe	3	7.527	0.03328	1.32548	1.36058	0.874
3	Norway	Western Europe	4	7.522	0.03880	1.45900	1.33095	0.885
4	Canada	North America	5	7.427	0.03553	1.32629	1.32261	0.905
...	...	...	...	...	...	...	...	
95	Bosnia and Herzegovina	Central and Eastern Europe	96	4.949	0.06913	0.83223	0.91916	0.790
96	Lesotho	Sub-Saharan Africa	97	4.898	0.09438	0.37545	1.04103	0.076
97	Dominican Republic	Latin America and Caribbean	98	4.885	0.07446	0.89537	1.17202	0.668
98	Laos	Southeastern Asia	99	4.876	0.06698	0.59066	0.73803	0.549
99	Mongolia	Eastern Asia	100	4.874	0.03313	0.82819	1.30060	0.602

100 rows × 12 columns

In [4]:

```
b.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 100 entries, 0 to 99
Data columns (total 12 columns):
 #   Column                         Non-Null Count  Dtype  
---  ------                         --------------  -----  
 0   Country                        100 non-null    object 
 1   Region                         100 non-null    object 
 2   Happiness Rank                 100 non-null    int64  
 3   Happiness Score                100 non-null    float64
 4   Standard Error                 100 non-null    float64
 5   Economy (GDP per Capita)       100 non-null    float64
 6   Family                         100 non-null    float64
 7   Health (Life Expectancy)       100 non-null    float64
 8   Freedom                        100 non-null    float64
 9   Trust (Government Corruption)  100 non-null    float64
 10  Generosity                     100 non-null    float64
 11  Dystopia Residual              100 non-null    float64
dtypes: float64(9), int64(1), object(2)
memory usage: 9.5+ KB
```

In [5]:

```
b.describe()
```

Out[5]:

	Happiness Rank	Happiness Score	Standard Error	Economy (GDP per Capita)	Family	Health (Life Expectancy)	Freedom
count	100.000000	100.00000	100.000000	100.000000	100.000000	100.000000	100.000000
mean	50.490000	6.06081	0.047206	1.045210	1.119594	0.747963	0.480267
std	29.000347	0.79900	0.017788	0.299610	0.175886	0.175114	0.135930
min	1.000000	4.87400	0.018480	0.083080	0.414110	0.076120	0.092450
25%	25.750000	5.35300	0.037135	0.875007	1.007810	0.666432	0.401975
50%	50.500000	5.91900	0.042650	1.073035	1.140595	0.755560	0.500285
75%	75.250000	6.75900	0.052268	1.272500	1.258182	0.885710	0.596122
max	100.000000	7.58700	0.136930	1.690420	1.402230	1.025250	0.669730

In [6]:

```
b.columns
```

Out[6]:

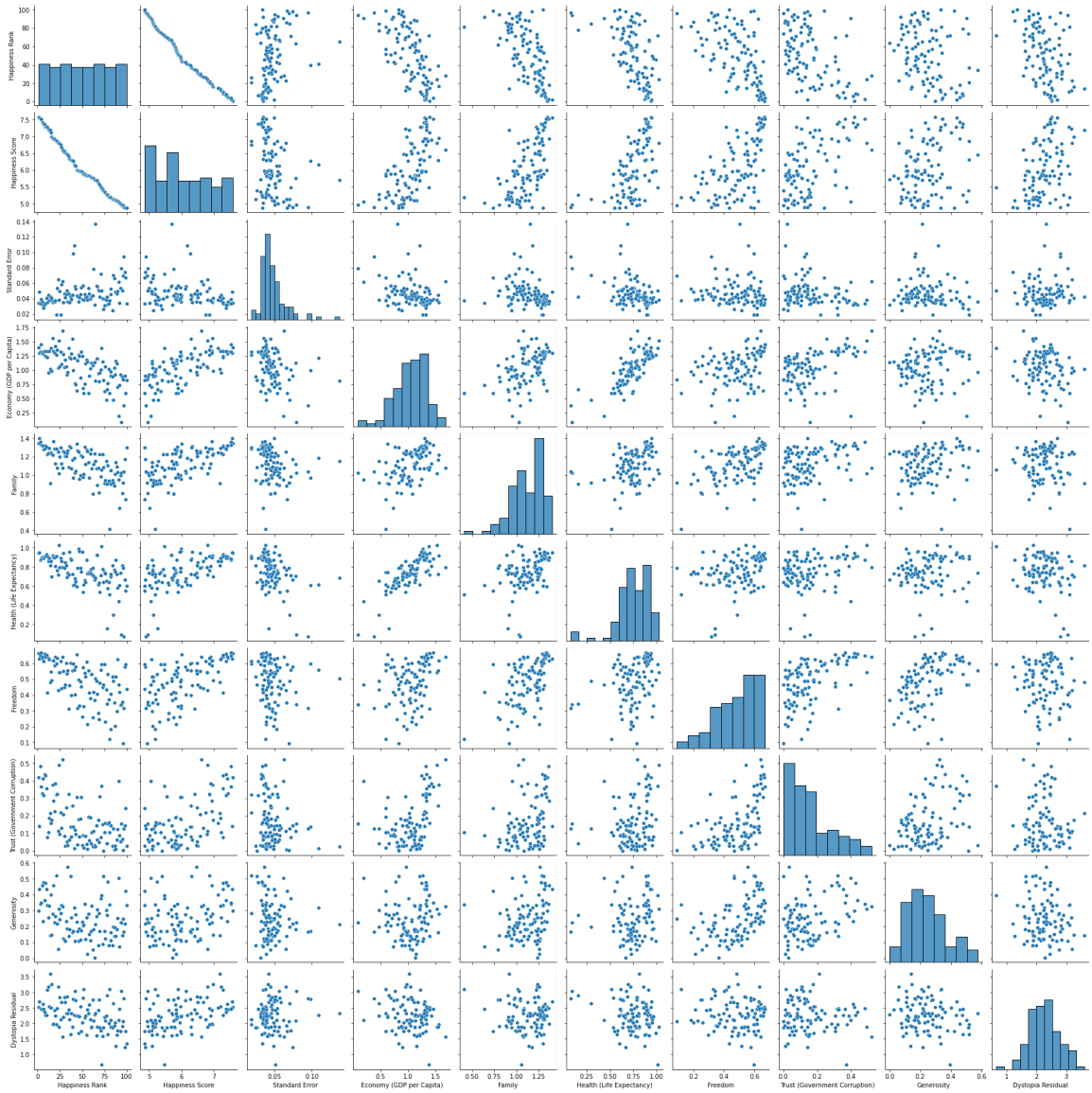
```
Index(['Country', 'Region', 'Happiness Rank', 'Happiness Score',
       'Standard Error', 'Economy (GDP per Capita)', 'Family',
       'Health (Life Expectancy)', 'Freedom', 'Trust (Government Corruptio
n)',
       'Generosity', 'Dystopia Residual'],
      dtype='object')
```

In [7]:

```
sns.pairplot(b)
```

Out[7]:

```
<seaborn.axisgrid.PairGrid at 0x1b0a05c5850>
```



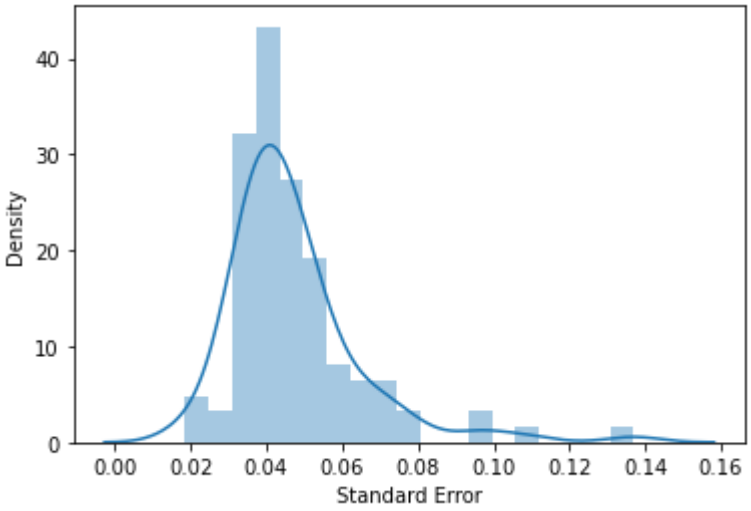
In [8]:

```
sns.distplot(b['Standard Error'])
```

```
C:\ProgramData\Anaconda3\lib\site-packages\seaborn\distributions.py:2557:
FutureWarning: `distplot` is a deprecated function and will be removed in
a future version. Please adapt your code to use either `displot` (a figure
-level function with similar flexibility) or `histplot` (an axes-level fun
ction for histograms).
  warnings.warn(msg, FutureWarning)
```

Out[8]:

```
<AxesSubplot:xlabel='Standard Error', ylabel='Density'>
```



In [9]:

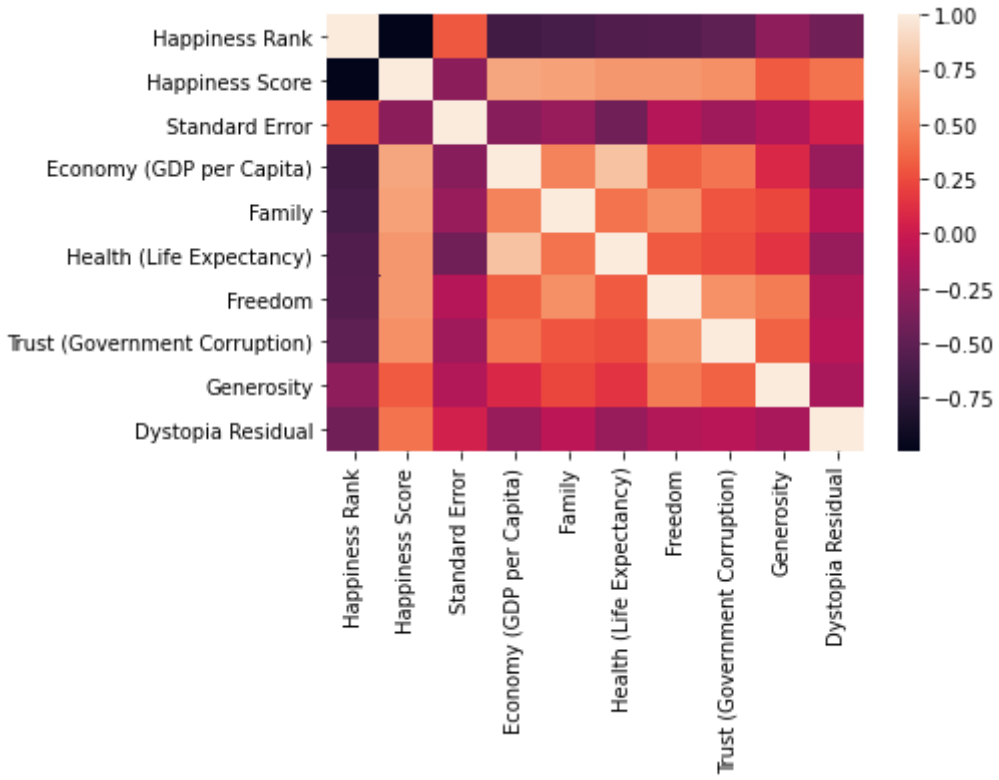
```
f=b[['Happiness Rank', 'Happiness Score',
       'Standard Error', 'Economy (GDP per Capita)', 'Family',
       'Health (Life Expectancy)', 'Freedom', 'Trust (Government Corruption)',
       'Generosity', 'Dystopia Residual']]
```

In [10]:

```
sns.heatmap(f.corr())
```

Out[10]:

```
<AxesSubplot:>
```



In [11]:

```
x=f[['Happiness Rank', 'Happiness Score',
       'Economy (GDP per Capita)', 'Family',
      'Health (Life Expectancy)', 'Freedom', 'Trust (Government Corruption)',
      'Generosity', 'Dystopia Residual']]
y=f['Standard Error']
```

In [12]:

```
from sklearn.model_selection import train_test_split
x_train,x_test,y_train,y_test=train_test_split(x,y,test_size=0.5)
```

In [13]:

```
from sklearn.linear_model import LinearRegression

lr=LinearRegression()
lr.fit(x_train,y_train)
```

Out[13]:

```
LinearRegression()
```

In [14]:

```
print(lr.intercept_)
```

```
0.16646920904372164
```

In [15]:

```
r=pd.DataFrame(lr.coef_,x.columns,columns=['Co-efficient'])
r
```

Out[15]:

	Co-efficient
Happiness Rank	-0.000309
Happiness Score	6.920235
Economy (GDP per Capita)	-6.915029
Family	-6.941234
Health (Life Expectancy)	-7.005046
Freedom	-6.888894
Trust (Government Corruption)	-6.959827
Generosity	-6.930491
Dystopia Residual	-6.932388

In [16]:

```
lr.score(x_train,y_train)
```

Out[16]:

```
0.4218032530856787
```

In [17]:

```
print(lr.score(x_test,y_test))
```

```
-0.07691868450813333
```

RIDGE REGRESSION

In [18]:

```
from sklearn.linear_model import Ridge,Lasso
```

In [19]:

```
rr=Ridge(alpha=10)
rr.fit(x_train,y_train)
```

Out[19]:

```
Ridge(alpha=10)
```

In [20]:

```
rr.score(x_test,y_test)
```

Out[20]:

```
0.060237235315044324
```

LASSO REGRESSION

In [21]:

```
la=Lasso(alpha=10)
la.fit(x_train,y_train)
```

Out[21]:

```
Lasso(alpha=10)
```

In [22]:

```
la.score(x_test,y_test)
```

Out[22]:

```
-0.006049236480226705
```

In [23]:

```
from sklearn.linear_model import ElasticNet
p=ElasticNet()
p.fit(x_train,y_train)
```

Out[23]:

```
ElasticNet()
```

In [24]:

```
print(p.coef_)
```

```
[ 0. -0. -0. -0. -0. -0. -0. -0.  0.]
```

In [25]:

```
print(p.intercept_)
```

```
0.0479178
```

In [26]:

```
print(p.predict(x_test))
```

```
[0.0479178 0.0479178 0.0479178 0.0479178 0.0479178 0.0479178 0.0479178
 0.0479178 0.0479178 0.0479178 0.0479178 0.0479178 0.0479178 0.0479178
 0.0479178 0.0479178 0.0479178 0.0479178 0.0479178 0.0479178 0.0479178
 0.0479178 0.0479178 0.0479178 0.0479178 0.0479178 0.0479178 0.0479178
 0.0479178 0.0479178 0.0479178 0.0479178 0.0479178 0.0479178 0.0479178
 0.0479178 0.0479178 0.0479178 0.0479178 0.0479178 0.0479178 0.0479178
 0.0479178]
```

In [27]:

```
prediction=p.predict(x_test)
print(p.score(x_test,y_test))
```

```
-0.006049236480226705
```

In [28]:

```
from sklearn import metrics
```

In [29]:

```
print("Mean Absolytre Error:",metrics.mean_absolute_error(y_test,prediction))
```

```
Mean Absolytre Error: 0.011870984
```

In [30]:

```
print("Mean Squared Error:",metrics.mean_squared_error(y_test,prediction))
```

```
Mean Squared Error: 0.0003369555362
```

In [31]:

```
print("Root Mean Squared Error:",np.sqrt(metrics.mean_squared_error(y_test,prediction)))
```

```
Root Mean Squared Error: 0.018356348661975233
```

In [ ]:

```

```