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


df= pd.read_csv("2019.csv")


df.head()
```

	Overall rank	Country or region	Score	GDP per capita	Social support	Healthy life expectancy	Freedom to make life choices	Generosity	Perce corr
0	1	Finland	7.769	1.340	1.587	0.986	0.596	0.153	
1	2	Denmark	7.600	1.383	1.573	0.996	0.592	0.252	
2	3	Norway	7.554	1.488	1.582	1.028	0.603	0.271	

```
df.shape
```

```
(156, 9)
```

```
print("The number of rows are : ",df.shape[0])
print("The number of columns are : ",df.shape[1])
```

```
The number of rows are :  156
The number of columns are :  9
```

```
df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 156 entries, 0 to 155
Data columns (total 9 columns):
 #   Column                        Non-Null Count  Dtype  
---  ------                        --------------  -----  
 0   Overall rank                  156 non-null    int64  
 1   Country or region             156 non-null    object 
 2   Score                         156 non-null    float64
 3   GDP per capita                156 non-null    float64
 4   Social support                156 non-null    float64
 5   Healthy life expectancy       156 non-null    float64
 6   Freedom to make life choices  156 non-null    float64
 7   Generosity                    156 non-null    float64
 8   Perceptions of corruption     156 non-null    float64
dtypes: float64(7), int64(1), object(1)
memory usage: 11.1+ KB
```

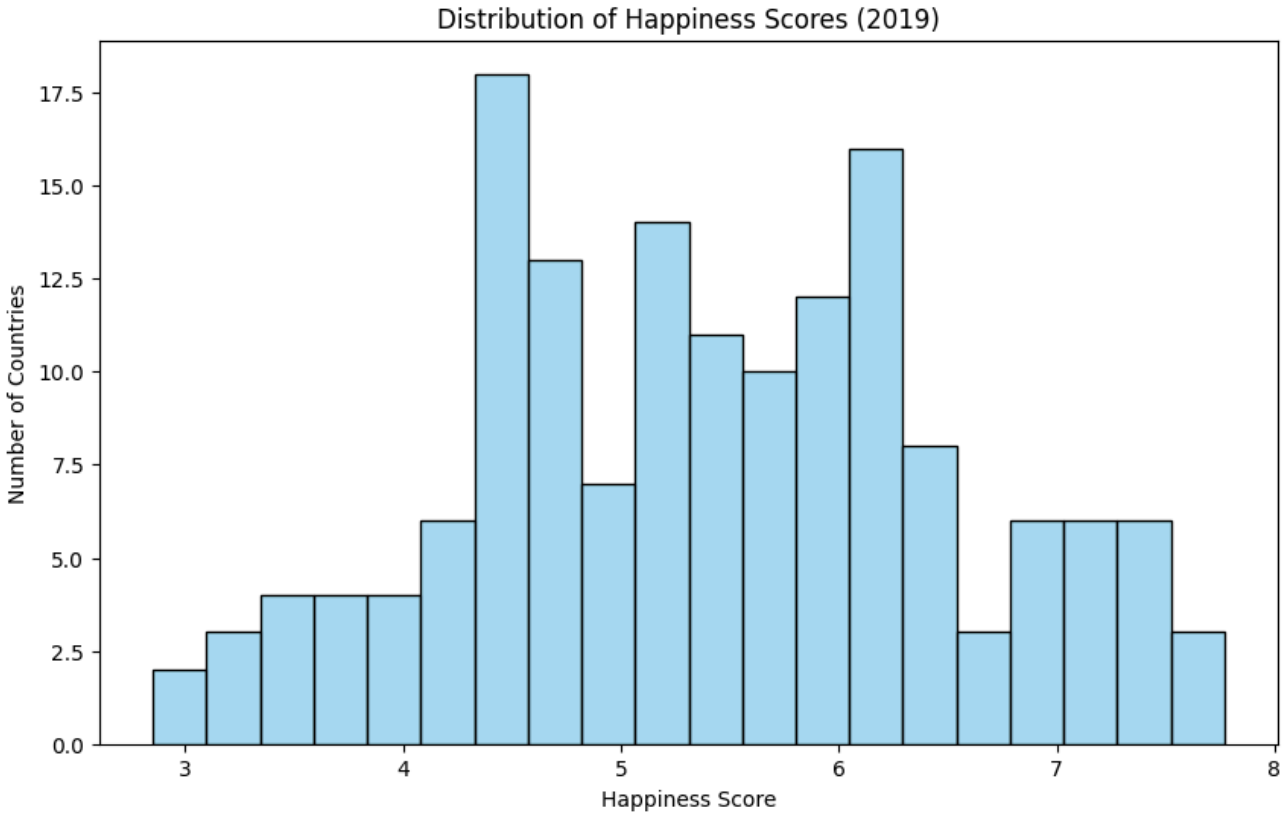
```
df.describe()
```

	Overall rank	Score	GDP per capita	Social support	Healthy life expectancy	Freedom to make life choices	Generosi
count	156.000000	156.000000	156.000000	156.000000	156.000000	156.000000	156.0000
mean	78.500000	5.407096	0.905147	1.208814	0.725244	0.392571	0.1848
std	45.177428	1.113120	0.398389	0.299191	0.242124	0.143289	0.0952
min	1.000000	2.853000	0.000000	0.000000	0.000000	0.000000	0.0000
25%	39.750000	4.544500	0.602750	1.055750	0.547750	0.308000	0.1087
50%	78.500000	5.379500	0.960000	1.271500	0.789000	0.417000	0.1775

```
df.describe(include='object')
```

	Country or region
count	156
unique	156
top	Finland
freq	1

```
plt.figure(figsize=(10, 6))
sns.histplot(df['Score'], bins=20, color='skyblue', edgecolor='black')
plt.title('Distribution of Happiness Scores (2019)')
plt.xlabel('Happiness Score')
plt.ylabel('Number of Countries')

plt.show()
```



Happiness Score Observations

- Score Range

  Happiness scores span from approximately 2.85 to 7.7, reflecting a wide variation in well-being across countries.

- Distribution Shape

  The overall distribution is fairly uniform, with a median score near 5, This Indicates a balanced spread between low and high levels of happiness.

- Score Concentration

  A significant number of countries fall within the 4.5 to 6.5 range, suggesting that a moderate level of happiness is most common globally.

- Outlier – Finland

  Finland stands out as a clear outlier with the highest happiness score, the only country in the 7.75–8.25 range, highlighting its exceptional performance in well-being indicators.

```
highest = df.sort_values('Score', ascending=False).head(10)

print("Top 10 Happiest Countries in 2019:")
highest[['Country or region', 'Score']]
```

```
Top 10 Happiest Countries in 2019:
```

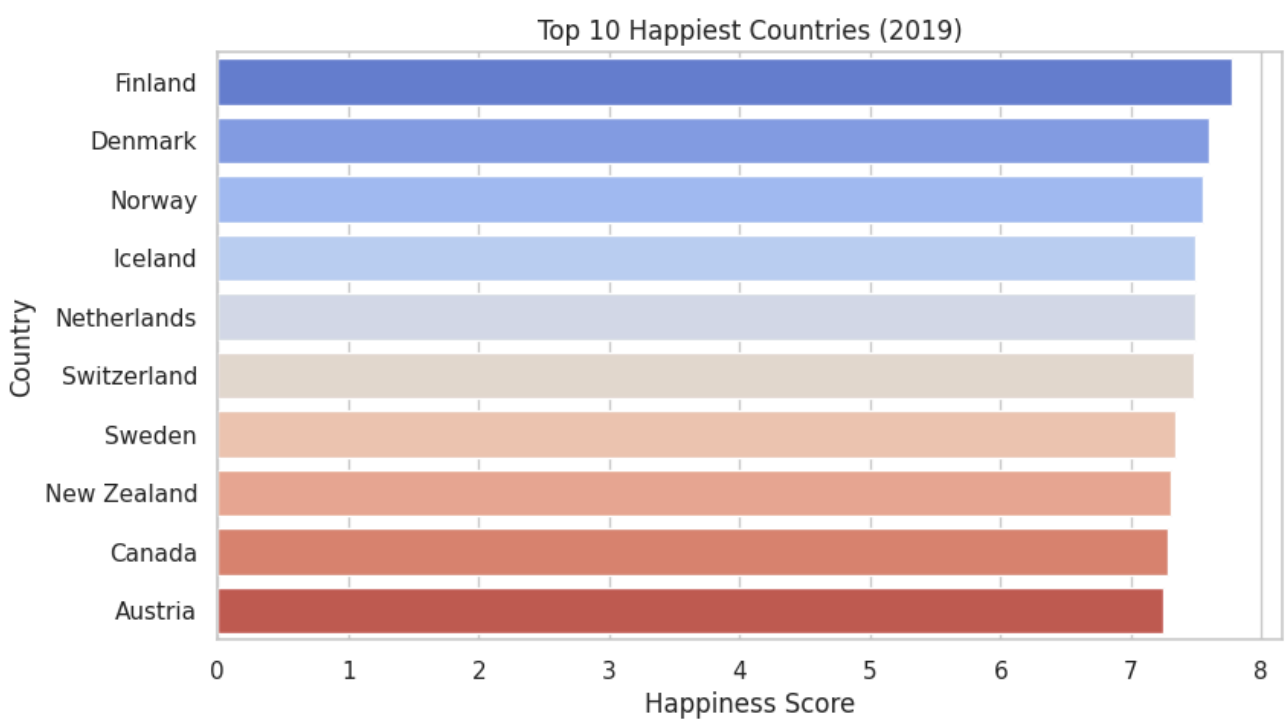
	Country or region	Score
0	Finland	7.769
1	Denmark	7.600
2	Norway	7.554
3	Iceland	7.494
4	Netherlands	7.488
5	Switzerland	7.480
6	Sweden	7.343
7	New Zealand	7.307
8	Canada	7.278
9	Austria	7.246

```
lowest = df.sort_values('Score', ascending=True).head(10)

print("\nBottom 10 Least Happy Countries in 2019:")
lowest[['Country or region', 'Score']]
```

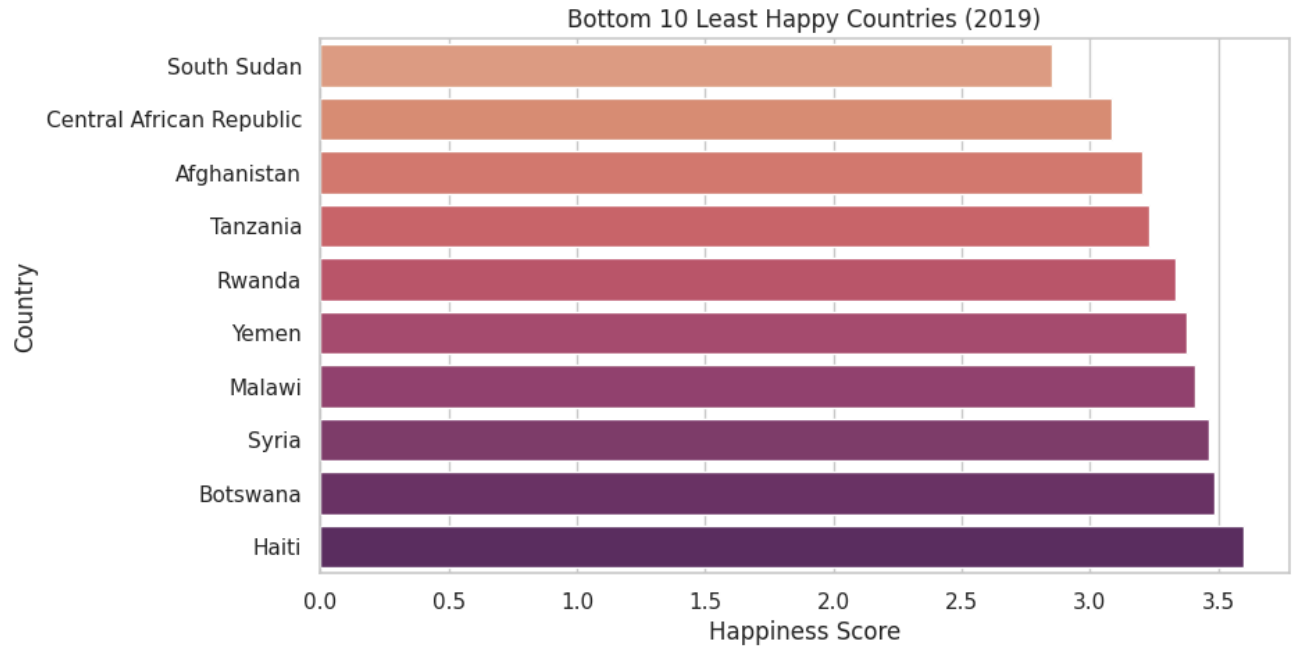
```
Bottom 10 Least Happy Countries in 2019:
```

	Country or region	Score
155	South Sudan	2.853
154	Central African Republic	3.083
153	Afghanistan	3.203
152	Tanzania	3.231
151	Rwanda	3.334
150	Yemen	3.380
149	Malawi	3.410
148	Syria	3.462
147	Botswana	3.488
146	Haiti	3.597

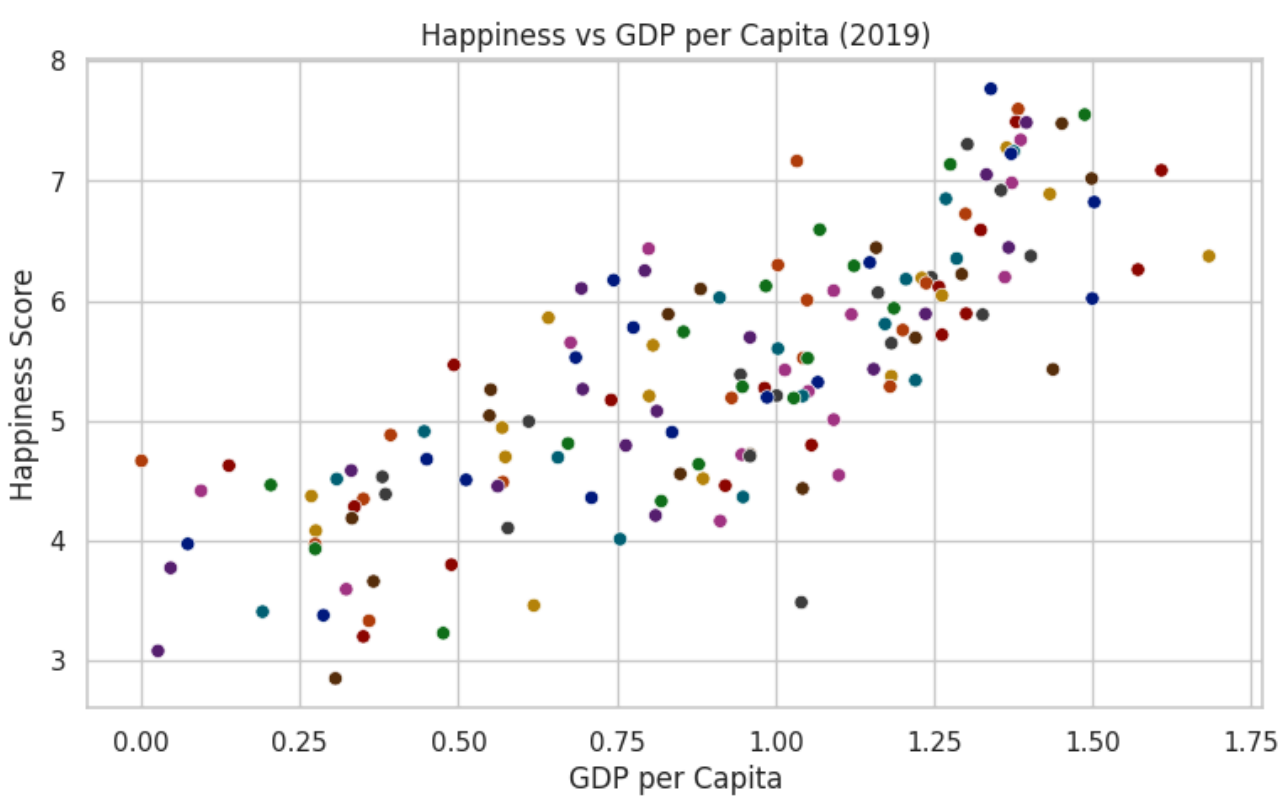
```
plt.figure(figsize=(9, 5))

sns.barplot(x='Score', y='Country or region', data=highest, palette='coolwarm', hue='Coun
plt.title('Top 10 Happiest Countries (2019)')
plt.xlabel('Happiness Score')
plt.ylabel('Country')
plt.show()
```




```
plt.figure(figsize=(9, 5))

sns.barplot(x='Score', y='Country or region', data=lowest, palette='flare', hue='Country
plt.title('Bottom 10 Least Happy Countries (2019)')
plt.xlabel('Happiness Score')
plt.ylabel('Country')
plt.show()
```




```
plt.figure(figsize=(9, 5))

sns.scatterplot(x='GDP per capita', y='Score', data=df, hue='Country or region', legend=F

plt.title('Happiness vs GDP per Capita (2019)')
plt.xlabel('GDP per Capita')
plt.ylabel('Happiness Score')

plt.show()
```

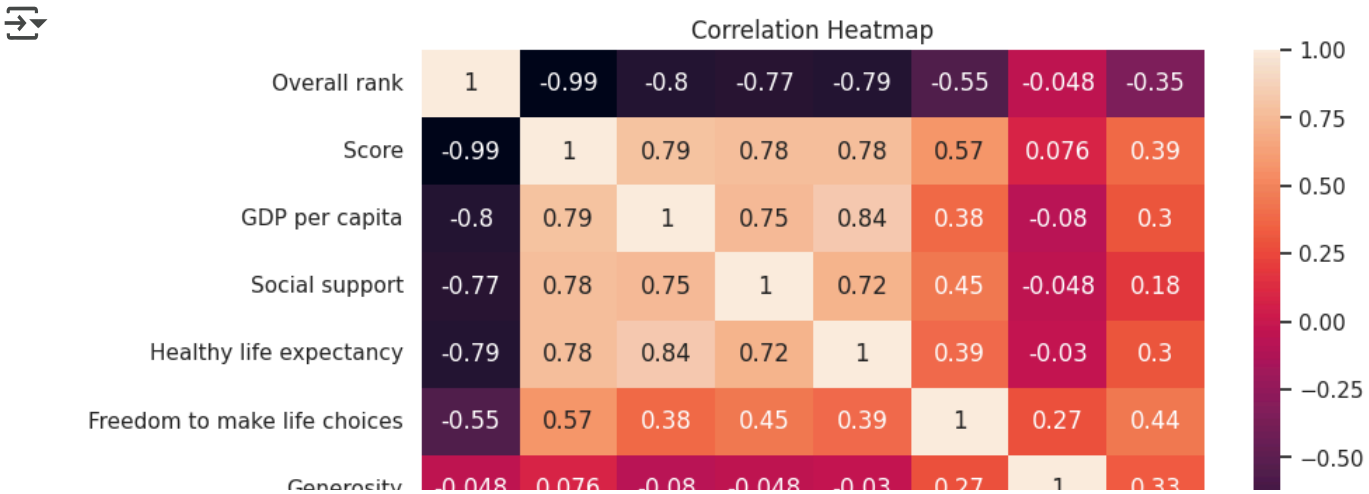



```
correlation = df['Score'].corr(df['GDP per capita'])
print(f'Correlation between GDP per Capita and Happiness Score: {correlation:.2f}')
```

```
Correlation between GDP per Capita and Happiness Score: 0.79
```

- The scatterplot shows there is an upward trend. Happiness Score improves as the GDP per capita rises.
- There is a positive correlation between the two.

```
plt.figure(figsize=(9, 5))

df_numeric = df.drop(columns=['Country or region'])
sns.heatmap(df_numeric.corr(), annot=True, cmap='rocket')
plt.title('Correlation Heatmap')
plt.show()
```


Correlation Heatmap
Overall rank
Score
GDP per capita
Social support
Healthy life expectancy
Freedom to make life choices
Generosity
1 -0.99 -0.8 -0.77 -0.79 -0.55 -0.048 -0.35
-0.99 1 0.79 0.78 0.78 0.57 0.076 0.39
-0.8 0.79 1 0.75 0.84 0.38 -0.08 0.3
-0.77 0.78 0.75 1 0.72 0.45 -0.048 0.18
-0.79 0.78 0.84 0.72 1 0.39 -0.03 0.3
-0.55 0.57 0.38 0.45 0.39 1 0.27 0.44
-0.048 0.076 -0.08 -0.048 -0.03 0.27 1 0.33
1.00
0.75
0.50
0.25
0.00
−0.25
−0.50