dac-phase3

October 17, 2023

[1]:
```
# This Python 3 environment comes with many helpful analytics libraries␣
 ↪installed
# It is defined by the kaggle/python Docker image: https://github.com/kaggle/
 ↪docker-python
# For example, here's several helpful packages to load

import numpy as np # linear algebra
import pandas as pd # data processing, CSV file I/O (e.g. pd.read_csv)

# Input data files are available in the read-only "../input/" directory
# For example, running this (by clicking run or pressing Shift+Enter) will list␣
 ↪all files under the input directory

import os
for dirname, _, filenames in os.walk('/kaggle/input'):
    for filename in filenames:
        print(os.path.join(dirname, filename))

# You can write up to 20GB to the current directory (/kaggle/working/) that␣
 ↪gets preserved as output when you create a version using "Save & Run All"
# You can also write temporary files to /kaggle/temp/, but they won't be saved␣
 ↪outside of the current session
```

```
/kaggle/input/corona-virus-report/covid_19_clean_complete.csv
/kaggle/input/corona-virus-report/country_wise_latest.csv
/kaggle/input/corona-virus-report/day_wise.csv
/kaggle/input/corona-virus-report/usa_county_wise.csv
/kaggle/input/corona-virus-report/worldometer_data.csv
/kaggle/input/corona-virus-report/full_grouped.csv
```

0.1 Import Liabraries

[2]:
```
import seaborn as sns
import matplotlib.pyplot as plt
import plotly.express as px
```

[3]:
```
df=pd.read_csv("/kaggle/input/corona-virus-report/covid_19_clean_complete.csv")
df.head()
```

[3]:
```
  Province/State Country/Region       Lat       Long        Date  Confirmed  \
0            NaN    Afghanistan  33.93911  67.709953  2020-01-22          0
1            NaN        Albania  41.15330  20.168300  2020-01-22          0
2            NaN        Algeria  28.03390   1.659600  2020-01-22          0
3            NaN        Andorra  42.50630   1.521800  2020-01-22          0
4            NaN         Angola -11.20270  17.873900  2020-01-22          0

   Deaths  Recovered  Active             WHO Region
0       0          0       0  Eastern Mediterranean
1       0          0       0                 Europe
2       0          0       0                 Africa
3       0          0       0                 Europe
4       0          0       0                 Africa
```

[4]:
```
df.shape
```

[4]:
```
(49068, 10)
```

[5]:
```
df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 49068 entries, 0 to 49067
Data columns (total 10 columns):
 #   Column          Non-Null Count  Dtype
---  ------          --------------  -----
 0   Province/State  14664 non-null  object
 1   Country/Region  49068 non-null  object
 2   Lat             49068 non-null  float64
 3   Long            49068 non-null  float64
 4   Date            49068 non-null  object
 5   Confirmed       49068 non-null  int64
 6   Deaths          49068 non-null  int64
 7   Recovered       49068 non-null  int64
 8   Active          49068 non-null  int64
 9   WHO Region      49068 non-null  object
dtypes: float64(2), int64(4), object(4)
memory usage: 3.7+ MB
```

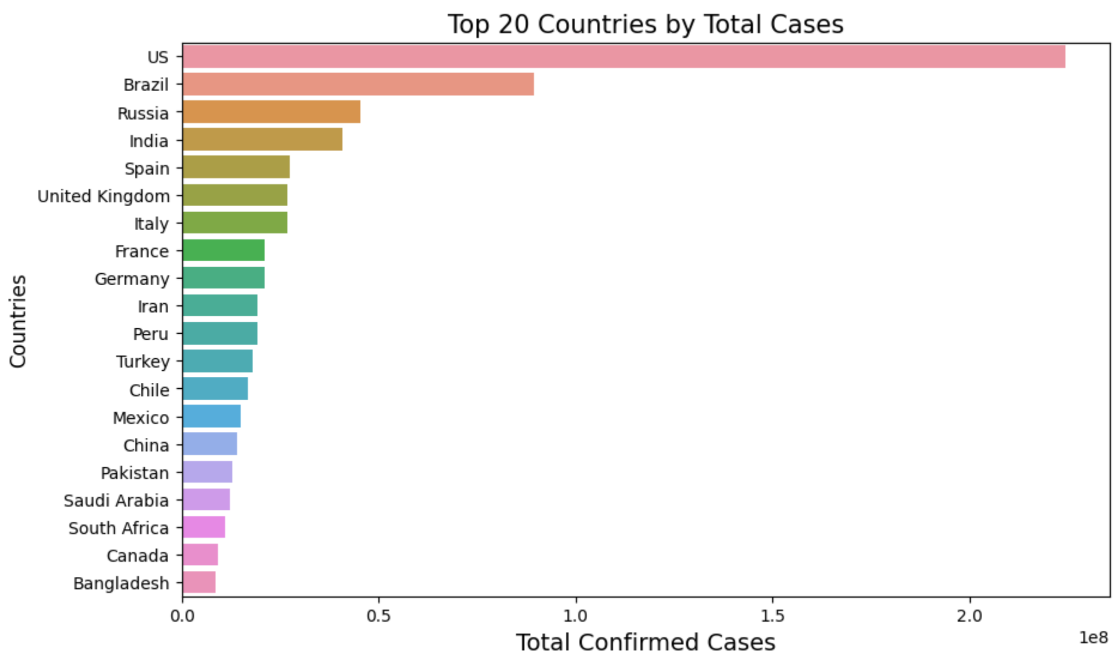
[6]:
```
df['Month'] = pd.to_datetime(df['Date']).dt.month
df['Year'] = pd.to_datetime(df['Date']).dt.year
```

[7]:
```
df.isnull().sum()
```

[7]:
```
Province/State    34404
Country/Region        0
Lat                   0
Long                  0
Date                  0
Confirmed             0
Deaths                0
Recovered             0
Active                0
WHO Region            0
Month                 0
Year                  0
dtype: int64
```

[8]:
```python
total_confirmed = df.groupby("Country/Region")["Confirmed"].sum().
  ↪sort_values(ascending=False).head(20).reset_index()
```

[9]:
```python
x_column = 'Confirmed'
y_column = 'Country/Region'

plt.figure(figsize=(10, 6))

sns.barplot(x=x_column, y=y_column, data=total_confirmed)

plt.xlabel('Total Confirmed Cases', fontsize=14)
plt.ylabel('Countries', fontsize=12)
plt.title('Top 20 Countries by Total Cases', fontsize=15)

plt.show()
```

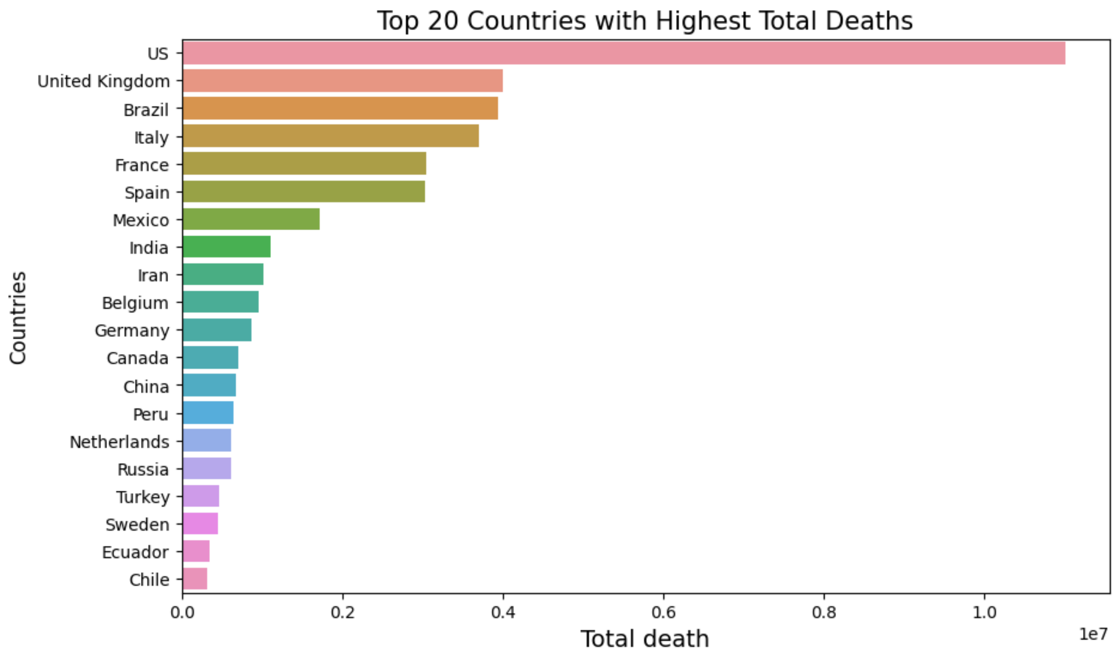


```
[10]: total_confirmed
```

```
[10]:     Country/Region  Confirmed
      0               US  224345948
      1           Brazil   89524967
      2           Russia   45408411
      3            India   40883464
      4            Spain   27404045
      5   United Kingdom   26748587
      6            Italy   26745145
      7           France   21210926
      8          Germany   21059152
      9             Iran   19339267
      10            Peru   19263916
      11          Turkey   17903345
      12           Chile   16935654
      13          Mexico   14946202
      14           China   14132002
      15        Pakistan   12833994
      16    Saudi Arabia   12362961
      17    South Africa   11168743
      18          Canada    9356551
      19      Bangladesh    8754729
```

```
[11]: total_death = df.groupby("Country/Region")["Deaths"].sum().
       ↪sort_values(ascending=False).head(20).reset_index()
```

```
[12]: x_column = 'Deaths'
      y_column = 'Country/Region'

      plt.figure(figsize=(10, 6))

      sns.barplot(x=x_column, y=y_column, data=total_death)

      plt.xlabel('Total death', fontsize=14)
      plt.ylabel('Countries', fontsize=12)
      plt.title('Top 20 Countries with Highest Total Deaths', fontsize=15)

      plt.show()
```



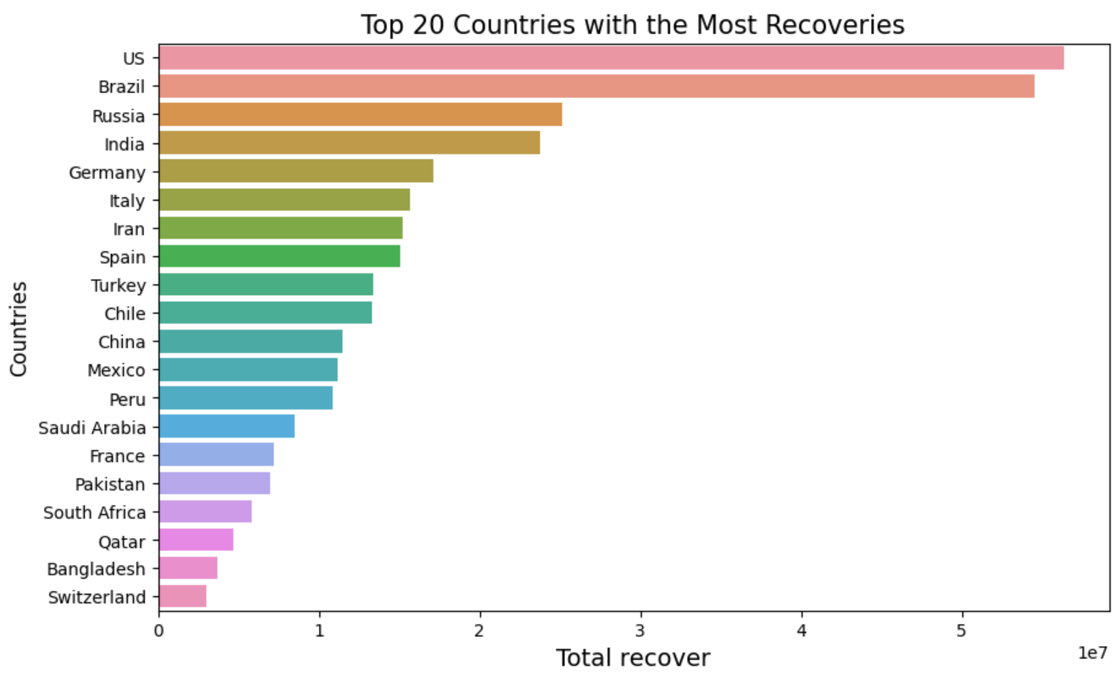
```
[13]: total_death
```

```
[13]:     Country/Region    Deaths
      0               US  11011411
      1   United Kingdom   3997775
      2           Brazil   3938034
      3            Italy   3707717
      4           France   3048524
      5            Spain   3033030
      6           Mexico   1728277
      7            India   1111831
      8             Iran   1024136
      9          Belgium    963679
```

```
10          Germany    871322
11           Canada    699566
12            China    672413
13             Peru    652113
14      Netherlands    622314
15           Russia    619385
16           Turkey    466056
17           Sweden    448913
18          Ecuador    346618
19            Chile    322480
```

[14]:
```
total_recover = df.groupby("Country/Region")["Recovered"].sum().
  ↪sort_values(ascending=False).head(20).reset_index()
```

[15]:
```
x_column = 'Recovered'
y_column = 'Country/Region'

plt.figure(figsize=(10, 6))

sns.barplot(x=x_column, y=y_column, data=total_recover)

plt.xlabel('Total recover', fontsize=14)
plt.ylabel('Countries', fontsize=12)
plt.title('Top 20 Countries with the Most Recoveries', fontsize=15)

plt.show()
```

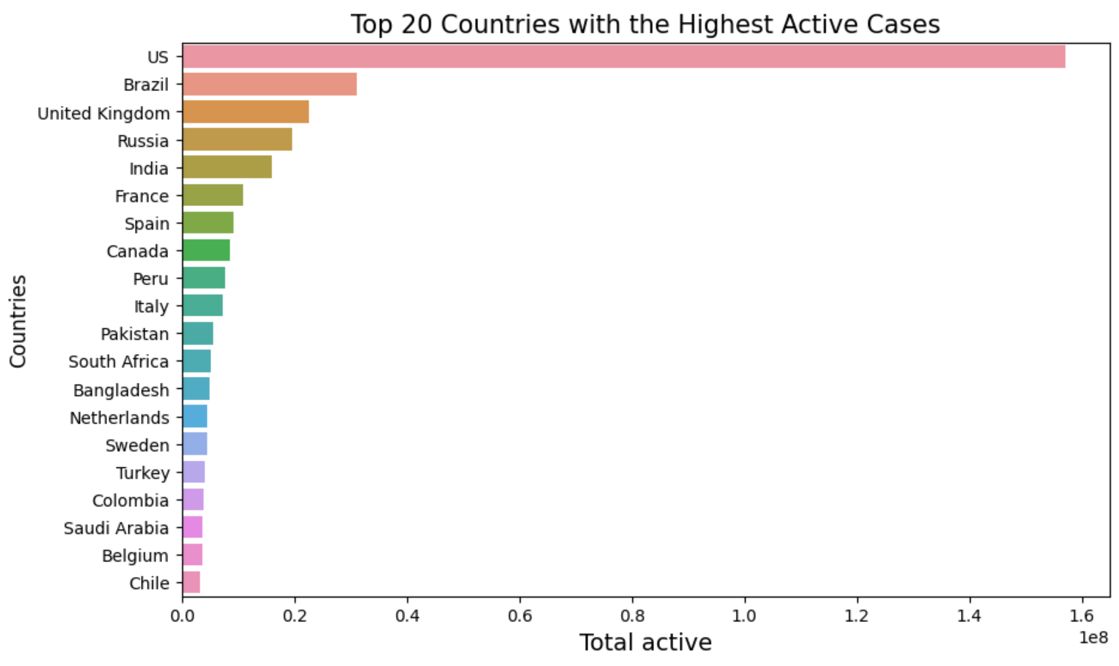


[16]:
```
total_recover
```

[16]:
```
   Country/Region  Recovered
0              US   56353416
1          Brazil   54492873
2          Russia   25120448
3           India   23783720
4         Germany   17107839
5           Italy   15673910
6            Iran   15200895
7           Spain   15093583
8          Turkey   13345389
9           Chile   13292593
10          China   11466866
11         Mexico   11141225
12           Peru   10862846
13   Saudi Arabia    8474107
14         France    7182115
15       Pakistan    6936003
16   South Africa    5836423
17          Qatar    4676443
18     Bangladesh    3714702
19    Switzerland    2957883
```

[17]:
```
total_active = df.groupby("Country/Region")["Active"].sum().
 ↪sort_values(ascending=False).head(20).reset_index()
```

[18]:
```
x_column = 'Active'
y_column = 'Country/Region'

plt.figure(figsize=(10, 6))  # Set the figure size as per your preference

sns.barplot(x=x_column, y=y_column, data=total_active)

plt.xlabel('Total active', fontsize=14)
plt.ylabel('Countries', fontsize=12)
plt.title('Top 20 Countries with the Highest Active Cases', fontsize=15)
plt.show()
```



[19]:
```
total_active
```

[19]:
```
      Country/Region     Active
0                 US  156981121
1             Brazil   31094060
2     United Kingdom   22624595
3             Russia   19668578
4              India   15987913
5             France   10980287
6              Spain    9277432
7             Canada    8656985
8               Peru    7748957
9              Italy    7363518
10          Pakistan    5633262
11      South Africa    5150341
12        Bangladesh    4924394
13       Netherlands    4528235
14            Sweden    4524247
15            Turkey    4091900
16          Colombia    3832786
17      Saudi Arabia    3783704
18           Belgium    3689945
19             Chile    3320581
```

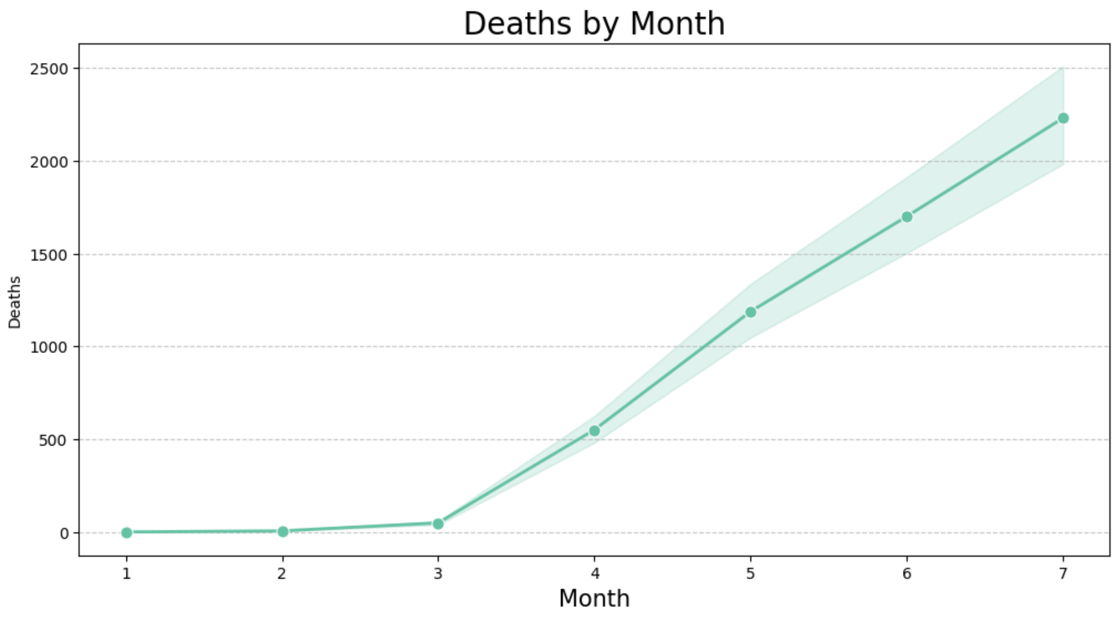
[20]:
```
fig = px.sunburst(df, path=['WHO Region', 'Country/Region'], values='Confirmed')

fig.update_layout(width = 700,
                  height = 600,
                  title = 'Total Confirmed',
                  title_x=0.5)

fig.show();
```

[21]:
```
fig = px.sunburst(df, path=['WHO Region', 'Country/Region'], values='Deaths')

fig.update_layout(width = 700,
                  height = 600,
                  title = 'Total Deaths',
                  title_x=0.5)

fig.show();
```

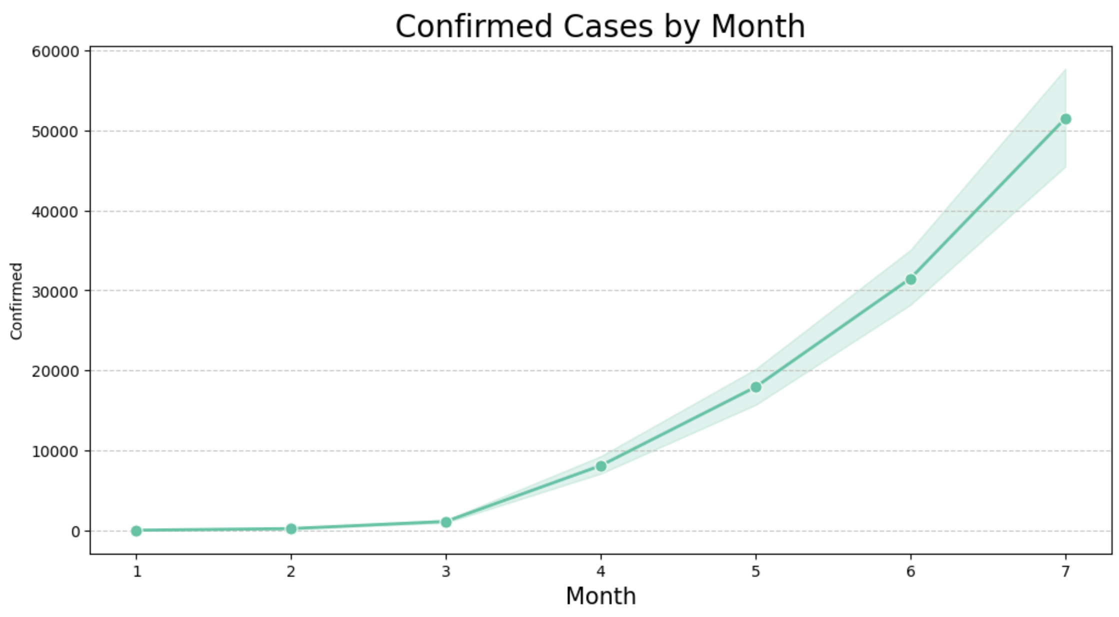
[22]:
```
fig = px.sunburst(df, path=['WHO Region', 'Country/Region'], values='Recovered')

fig.update_layout(width = 700,
                  height = 600,
                  title = 'Total Recovered',
                  title_x=0.5)

fig.show();
```

[23]:
```
fig = px.sunburst(df, path=['WHO Region', 'Country/Region'], values='Active')

fig.update_layout(width = 700,
                  height = 600,
                  title = 'Total Active',
                  title_x=0.5)

fig.show();
```

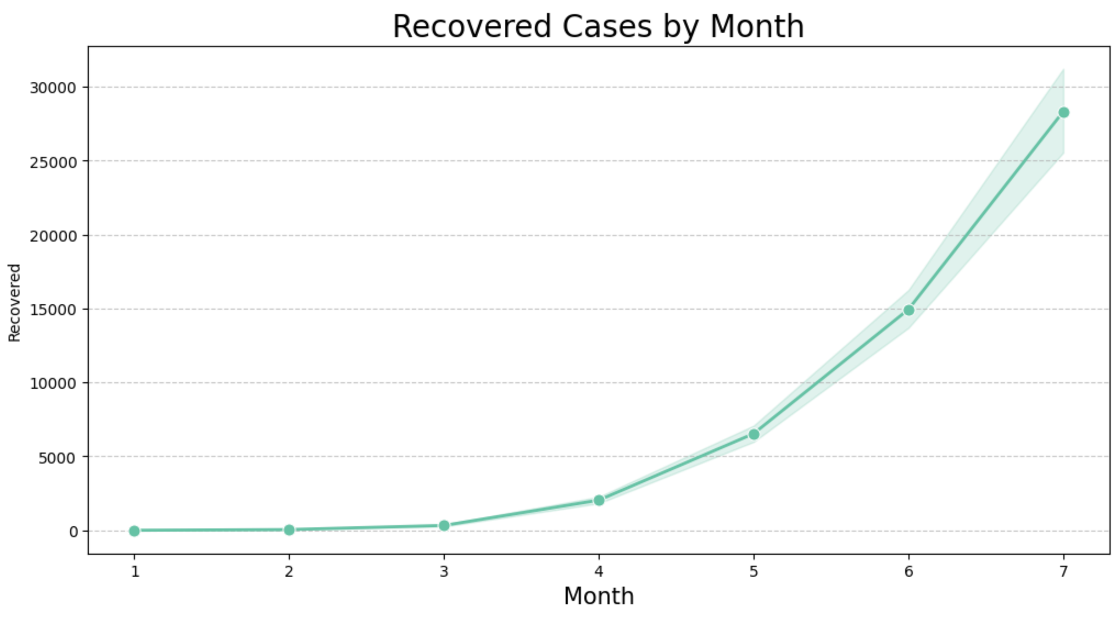
[24]:
```
x_column = 'Month'
y_column = 'Deaths'

custom_palette = sns.color_palette("Set2")

plt.figure(figsize=(12, 6))

sns.lineplot(x=x_column, y=y_column, data=df, linewidth=2,␣
 ↪color=custom_palette[0], marker='o', markersize=8)

plt.xlabel('Month', fontsize=15)
plt.title('Deaths by Month', fontsize=20)

plt.grid(axis='y', linestyle='--', alpha=0.7)

# Customize the legend
plt.show()
```



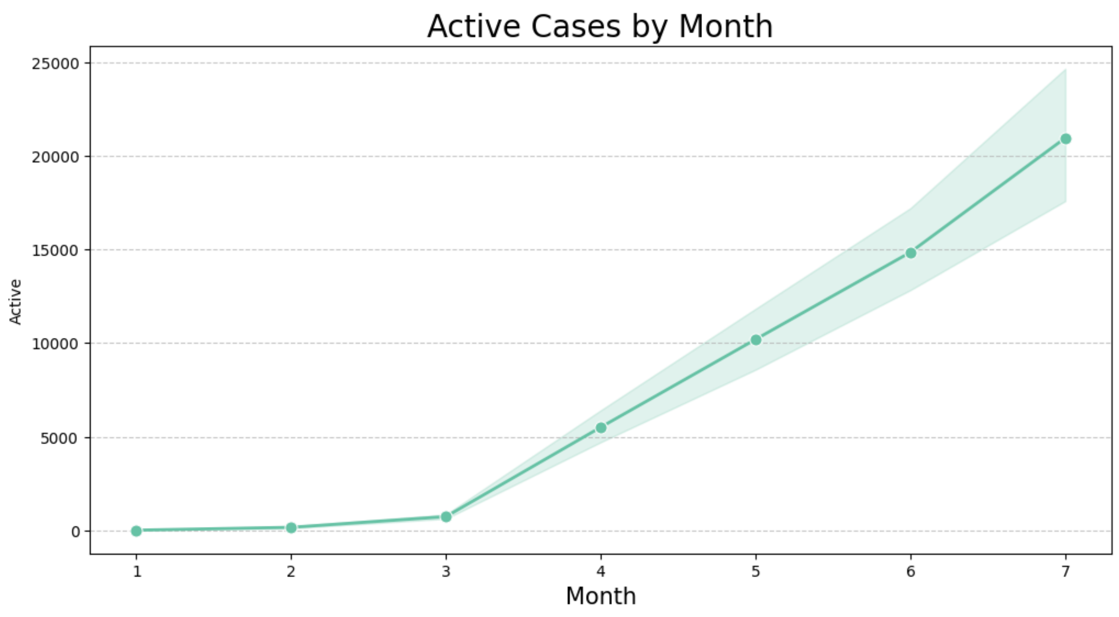
[25]:
```
x_column = 'Month'
y_column = 'Confirmed'

custom_palette = sns.color_palette("Set2")

plt.figure(figsize=(12, 6))

sns.lineplot(x=x_column, y=y_column, data=df, linewidth=2,␣
 ↪color=custom_palette[0], marker='o', markersize=8)

plt.xlabel('Month', fontsize=15)
plt.title('Confirmed Cases by Month', fontsize=20)

plt.grid(axis='y', linestyle='--', alpha=0.7)


plt.show()
```



[26]:
```
x_column = 'Month'
y_column = 'Recovered'

custom_palette = sns.color_palette("Set2")

plt.figure(figsize=(12, 6))

sns.lineplot(x=x_column, y=y_column, data=df, linewidth=2,␣
 ↪color=custom_palette[0], marker='o', markersize=8)

plt.xlabel('Month', fontsize=15)
plt.title('Recovered Cases by Month', fontsize=20)

plt.grid(axis='y', linestyle='--', alpha=0.7)


plt.show()
```

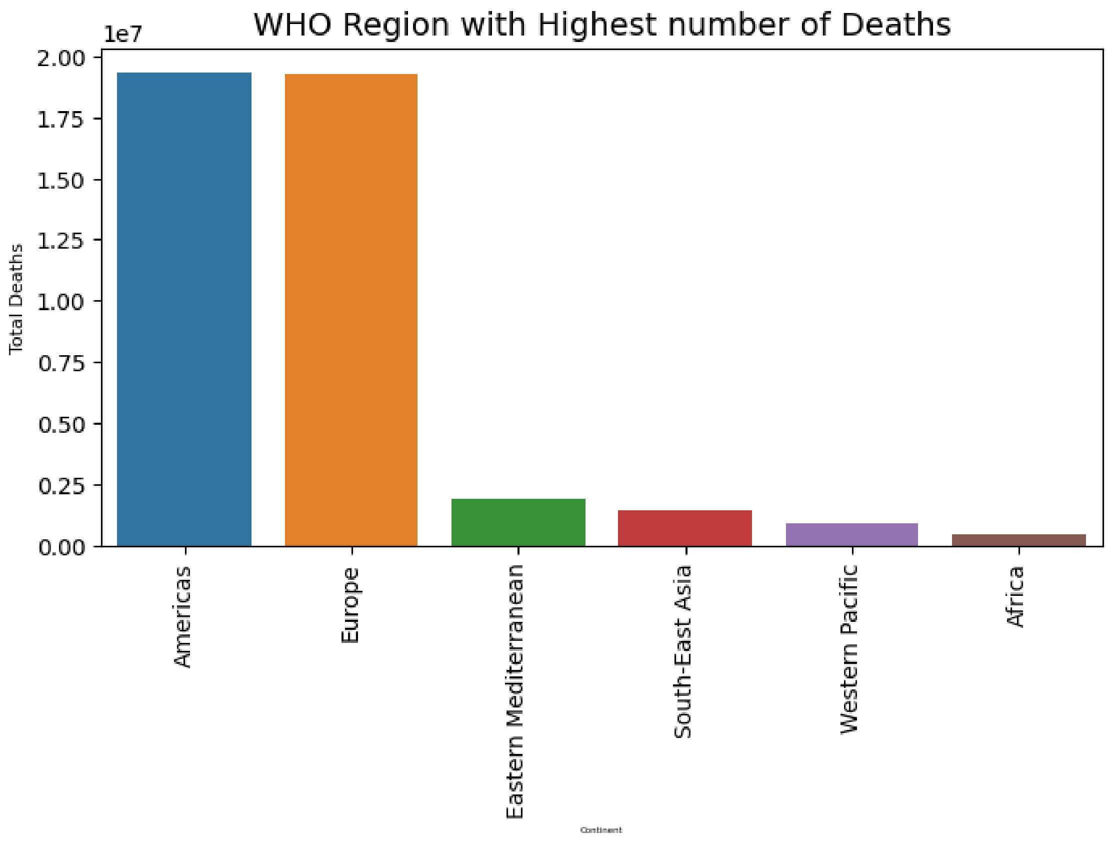


[27]:
```
x_column = 'Month'
y_column = 'Active'

custom_palette = sns.color_palette("Set2")

plt.figure(figsize=(12, 6))

sns.lineplot(x=x_column, y=y_column, data=df, linewidth=2,␣
 ↪color=custom_palette[0], marker='o', markersize=8)

plt.xlabel('Month', fontsize=15)
plt.title('Active Cases by Month', fontsize=20)

plt.grid(axis='y', linestyle='--', alpha=0.7)


plt.show()
```



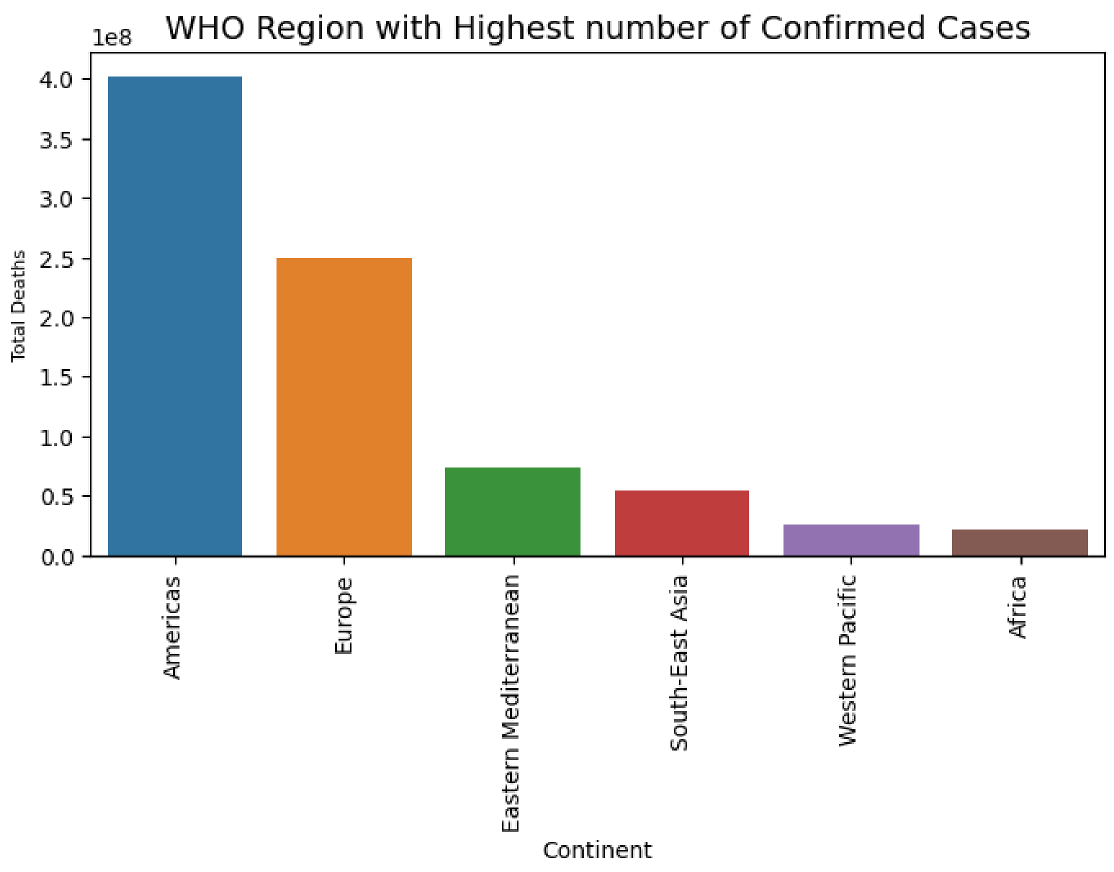
```
[28]: df_death = df.groupby("WHO Region")["Deaths"].sum().
       ↪sort_values(ascending=False).head(10).reset_index()
```

```
[29]: x_column = 'WHO Region'
      y_column = 'Deaths'

      plt.figure(figsize=(8, 4))

      sns.barplot(x=x_column, y=y_column, data=df_death)

      plt.xlabel('Continent', fontsize=4)
      plt.ylabel('Total Deaths', fontsize=8)
      plt.title('WHO Region with Highest number of Deaths', fontsize=14)

      plt.xticks(rotation=90)

      plt.show()
```



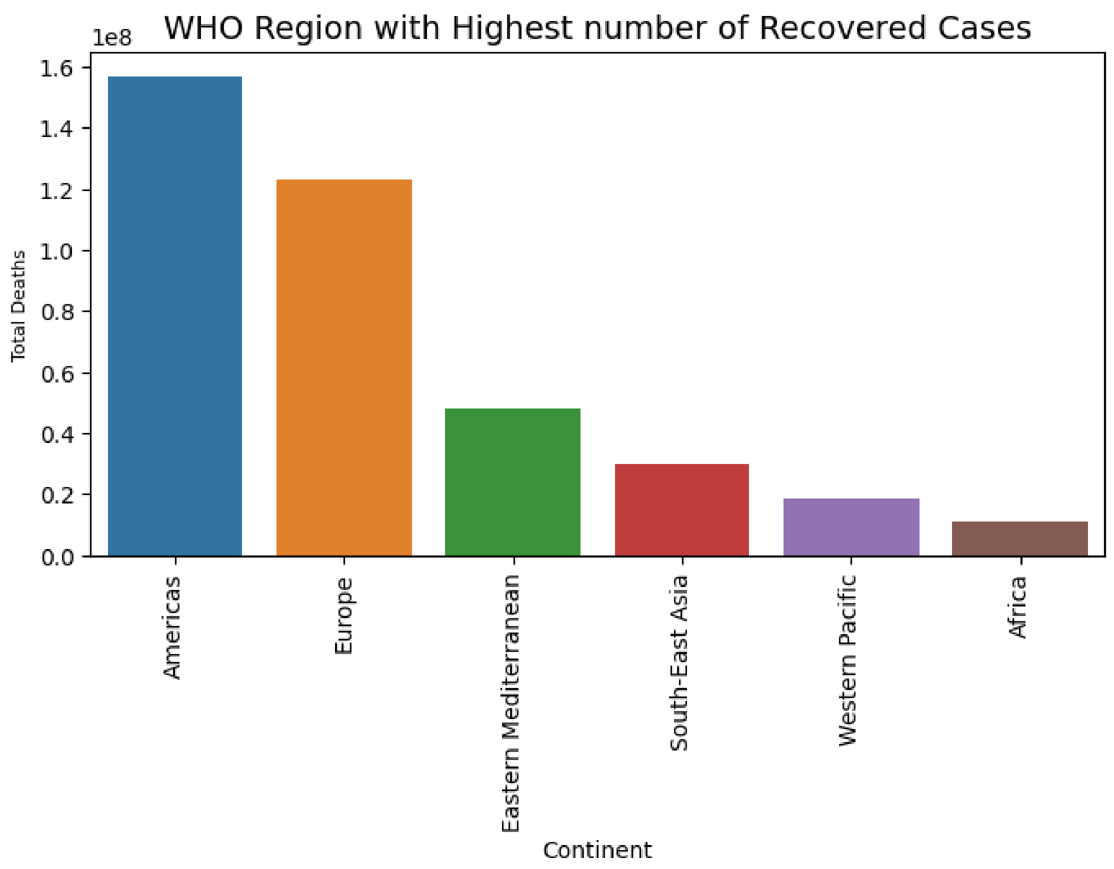
[30]:
```
df_conferm = df.groupby("WHO Region")["Confirmed"].sum().
 ↪sort_values(ascending=False).head(10).reset_index()
```

[31]:
```
x_column = 'WHO Region'
y_column = 'Confirmed'

plt.figure(figsize=(8, 4))

sns.barplot(x=x_column, y=y_column, data=df_conferm)

plt.xlabel('Continent', fontsize=10)
plt.ylabel('Total Deaths', fontsize=8)
plt.title('WHO Region with Highest number of Confirmed Cases', fontsize=14)

plt.xticks(rotation=90)

plt.show()
```



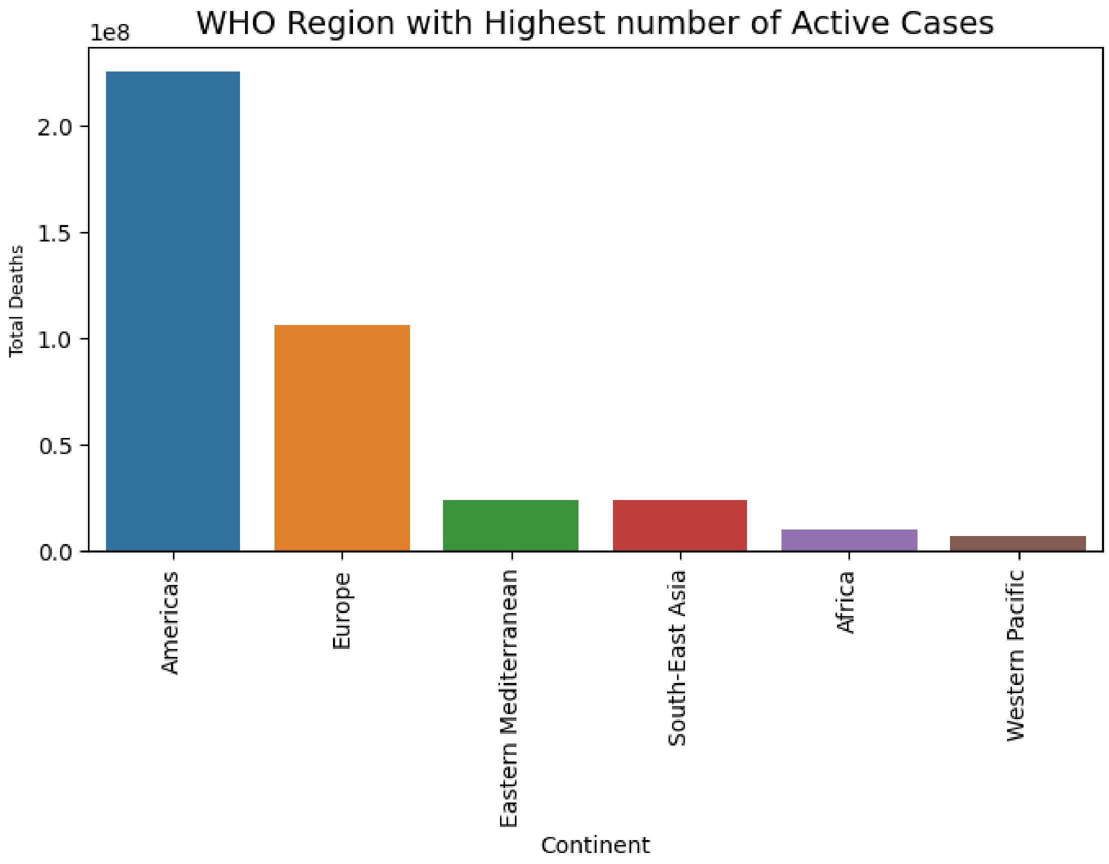
[32]:
```
df_recover = df.groupby("WHO Region")["Recovered"].sum().
 ↪sort_values(ascending=False).head(10).reset_index()
```

[33]:
```
x_column = 'WHO Region'
y_column = 'Recovered'

plt.figure(figsize=(8, 4))

sns.barplot(x=x_column, y=y_column, data=df_recover)

plt.xlabel('Continent', fontsize=10)
plt.ylabel('Total Deaths', fontsize=8)
plt.title('WHO Region with Highest number of Recovered Cases', fontsize=14)

plt.xticks(rotation=90)

plt.show()
```



[34]:
```
df_active = df.groupby("WHO Region")["Active"].sum().
 ↪sort_values(ascending=False).head(10).reset_index()
```

[35]:
```
x_column = 'WHO Region'
y_column = 'Active'

plt.figure(figsize=(8, 4))

sns.barplot(x=x_column, y=y_column, data=df_active)

plt.xlabel('Continent', fontsize=10)
plt.ylabel('Total Deaths', fontsize=8)
plt.title('WHO Region with Highest number of Active Cases', fontsize=14)

plt.xticks(rotation=90)

plt.show()
```


WHO Region with Highest number of Active Cases
1e8
2.0
1.5
1.0
0.5
0.0
Total Deaths
Americas
Europe
Eastern Mediterranean
South-East Asia
Africa
Western Pacific
Continent