dspproject

November 16, 2023

[101]:

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

[102]:

```
df=pd.read_csv("worldometer_data.csv")
```

[103]:

```
df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 209 entries, 0 to 208
Data columns (total 16 columns):
 #   Column            Non-Null Count  Dtype
---  ------            --------------  -----
 0   Country/Region    209 non-null    object
 1   Continent         208 non-null    object
 2   Population        208 non-null    float64
 3   TotalCases        209 non-null    int64
 4   NewCases          4 non-null      float64
 5   TotalDeaths       188 non-null    float64
 6   NewDeaths         3 non-null      float64
 7   TotalRecovered    205 non-null    float64
 8   NewRecovered      3 non-null      float64
 9   ActiveCases       205 non-null    float64
 10  Serious,Critical  122 non-null    float64
 11  Tot Cases/1M pop  208 non-null    float64
 12  Deaths/1M pop     187 non-null    float64
 13  TotalTests        191 non-null    float64
 14  Tests/1M pop      191 non-null    float64
 15  WHO Region        184 non-null    object
dtypes: float64(12), int64(1), object(3)
memory usage: 26.3+ KB
```

[104]:

```
df
```

[104]:

```
           Country/Region      Continent    Population  TotalCases  NewCases  \
0                     USA  North America  3.311981e+08     5032179       NaN
1                  Brazil  South America  2.127107e+08     2917562       NaN
```

```
2                    India           Asia  1.381345e+09     2025409       NaN
3                   Russia         Europe  1.459409e+08      871894       NaN
4             South Africa         Africa  5.938157e+07      538184       NaN
..                     …            …           …         …       …
204             Montserrat  North America  4.992000e+03           13       NaN
205  Caribbean Netherlands  North America  2.624700e+04           13       NaN
206       Falkland Islands  South America  3.489000e+03           13       NaN
207           Vatican City         Europe  8.010000e+02           12       NaN
208         Western Sahara         Africa  5.986820e+05           10       NaN

     TotalDeaths  NewDeaths  TotalRecovered  NewRecovered  ActiveCases  
0       162804.0        NaN       2576668.0           NaN    2292707.0  \
1        98644.0        NaN       2047660.0           NaN     771258.0  
2        41638.0        NaN       1377384.0           NaN     606387.0  
3        14606.0        NaN        676357.0           NaN     180931.0  
4         9604.0        NaN        387316.0           NaN     141264.0  
..           …        …             …           …          …  
204          1.0        NaN            10.0           NaN          2.0  
205          NaN        NaN             7.0           NaN          6.0  
206          NaN        NaN            13.0           NaN          0.0  
207          NaN        NaN            12.0           NaN          0.0  
208          1.0        NaN             8.0           NaN          1.0  

     Serious,Critical  Tot Cases/1M pop  Deaths/1M pop  TotalTests  
0             18296.0           15194.0          492.0  63139605.0  \
1              8318.0           13716.0          464.0  13206188.0  
2              8944.0            1466.0           30.0  22149351.0  
3              2300.0            5974.0          100.0  29716907.0  
4               539.0            9063.0          162.0   3149807.0  
..                …               …            …         …  
204               NaN            2604.0          200.0        61.0  
205               NaN             495.0            NaN       424.0  
206               NaN            3726.0            NaN      1816.0  
207               NaN           14981.0            NaN         NaN  
208               NaN              17.0            2.0         NaN  

     Tests/1M pop      WHO Region  
0        190640.0        Americas  
1         62085.0        Americas  
2         16035.0  South-EastAsia  
3        203623.0          Europe  
4         53044.0          Africa  
..            …             …  
204       12220.0             NaN  
205       16154.0             NaN  
206      520493.0             NaN  
207           NaN          Europe  
```

```
208           NaN          Africa

[209 rows x 16 columns]
```

[105]:

```
df.isna().sum()
```

[105]:

```
Country/Region        0
Continent             1
Population            1
TotalCases            0
NewCases            205
TotalDeaths          21
NewDeaths           206
TotalRecovered        4
NewRecovered        206
ActiveCases           4
Serious,Critical     87
Tot Cases/1M pop      1
Deaths/1M pop        22
TotalTests           18
Tests/1M pop         18
WHO Region           25
dtype: int64
```

[106]:

```
df1=df.drop(["NewCases","NewDeaths","NewRecovered"],axis=1)
```

[107]:

```
df1 = df1.fillna(df.mode().iloc[0])
```

[108]:

```
df1.head()
```

[108]:

```
  Country/Region      Continent    Population  TotalCases  TotalDeaths  \
0            USA  North America  3.311981e+08     5032179     162804.0
1         Brazil  South America  2.127107e+08     2917562      98644.0
2          India           Asia  1.381345e+09     2025409      41638.0
3         Russia         Europe  1.459409e+08      871894      14606.0
4   South Africa         Africa  5.938157e+07      538184       9604.0

   TotalRecovered  ActiveCases  Serious,Critical  Tot Cases/1M pop  \
0       2576668.0    2292707.0           18296.0           15194.0
1       2047660.0     771258.0            8318.0           13716.0
2       1377384.0     606387.0            8944.0            1466.0
3        676357.0     180931.0            2300.0            5974.0
4        387316.0     141264.0             539.0            9063.0

   Deaths/1M pop  TotalTests  Tests/1M pop      WHO Region
0          492.0  63139605.0      190640.0        Americas
1          464.0  13206188.0       62085.0        Americas
```

```
2            30.0  22149351.0       16035.0  South-EastAsia
3           100.0  29716907.0      203623.0          Europe
4           162.0   3149807.0       53044.0          Africa
```

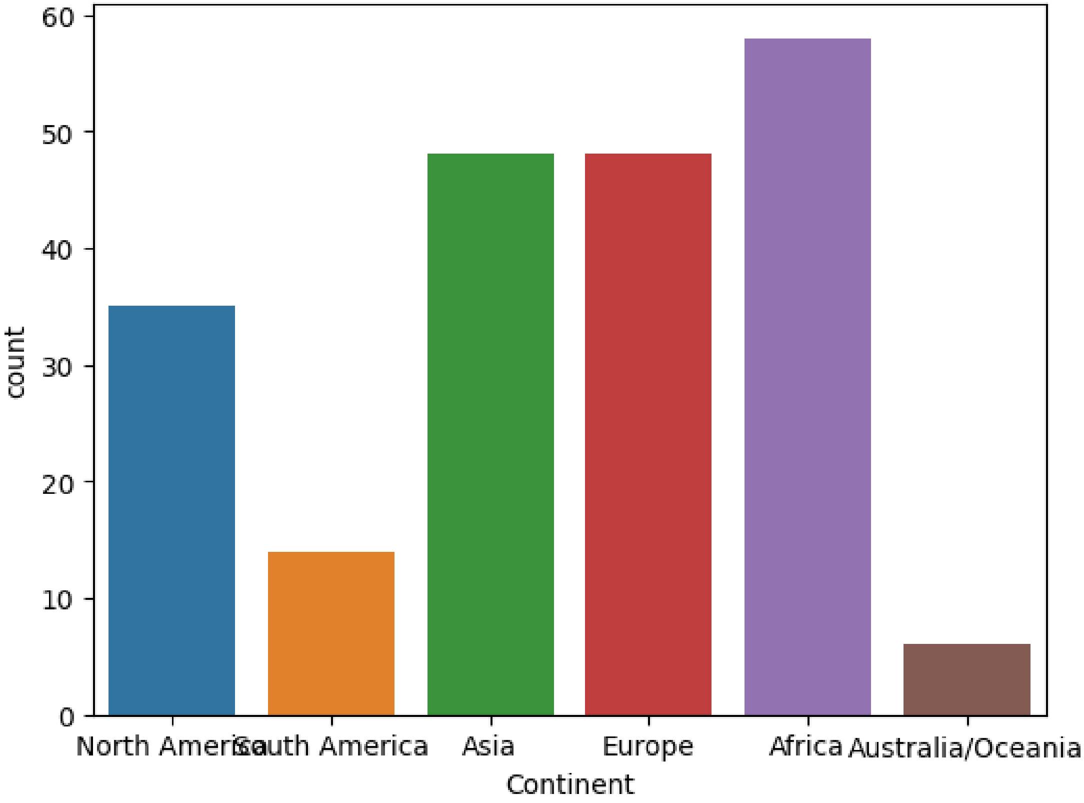
[109]:
```
df1.describe()
```

[109]:
```
         Population    TotalCases    TotalDeaths  TotalRecovered  \
count  2.090000e+02  2.090000e+02     209.000000    2.090000e+02
mean   3.026996e+07  9.171850e+04    3411.617225    5.775245e+04
std    1.045351e+08  4.325867e+05   14728.970729    2.543467e+05
min    8.010000e+02  1.000000e+01       1.000000    7.000000e+00
25%    8.970950e+05  7.120000e+02      12.000000    3.080000e+02
50%    6.942854e+06  4.491000e+03      70.000000    2.010000e+03
75%    2.552886e+07  3.689600e+04     600.000000    1.959600e+04
max    1.381345e+09  5.032179e+06  162804.000000    2.576668e+06

        ActiveCases  Serious,Critical  Tot Cases/1M pop  Deaths/1M pop  \
count  2.090000e+02        209.000000        209.000000     209.000000
mean   2.713487e+04        312.358852       3180.770335      88.925263
std    1.729872e+05       1583.753010       5184.182955     167.884540
min    0.000000e+00          1.000000          3.000000       0.080000
25%    7.400000e+01          1.000000        279.000000       6.000000
50%    8.580000e+02          2.000000       1000.000000      20.000000
75%    7.113000e+03         41.000000       3806.000000      80.000000
max    2.292707e+06      18296.000000      39922.000000    1238.000000

         TotalTests   Tests/1M pop
count  2.090000e+02     209.000000
mean   1.281753e+06   79359.172249
std    5.322241e+06  146743.354760
min    6.100000e+01       4.000000
25%    1.080800e+04   10731.000000
50%    1.099460e+05   30546.000000
75%    6.924300e+05   75521.000000
max    6.313960e+07  995282.000000
```

[ ]:
```

```

[110]:
```
sns.countplot(x="Continent",data=df1)
```

[110]:
```
<Axes: xlabel='Continent', ylabel='count'>
```

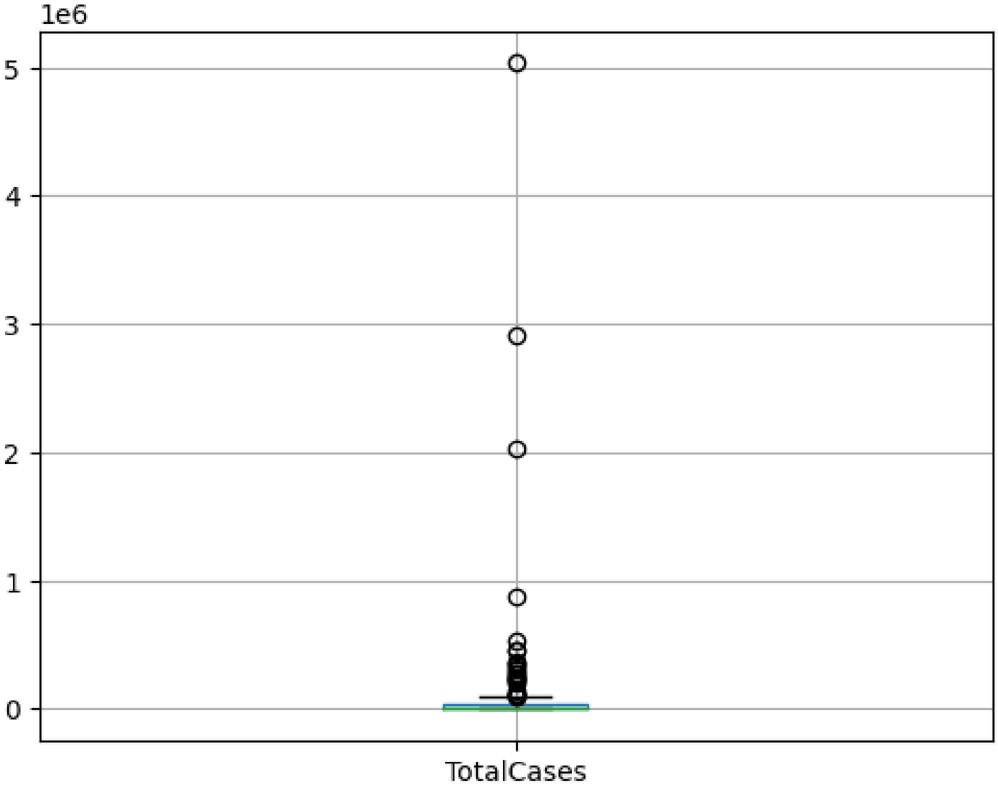


```
[111]: df1.isna().sum()
```

```
[111]: Country/Region      0
       Continent           0
       Population          0
       TotalCases          0
       TotalDeaths         0
       TotalRecovered      0
       ActiveCases         0
       Serious,Critical    0
       Tot Cases/1M pop    0
       Deaths/1M pop       0
       TotalTests          0
       Tests/1M pop        0
       WHO Region          0
       dtype: int64
```

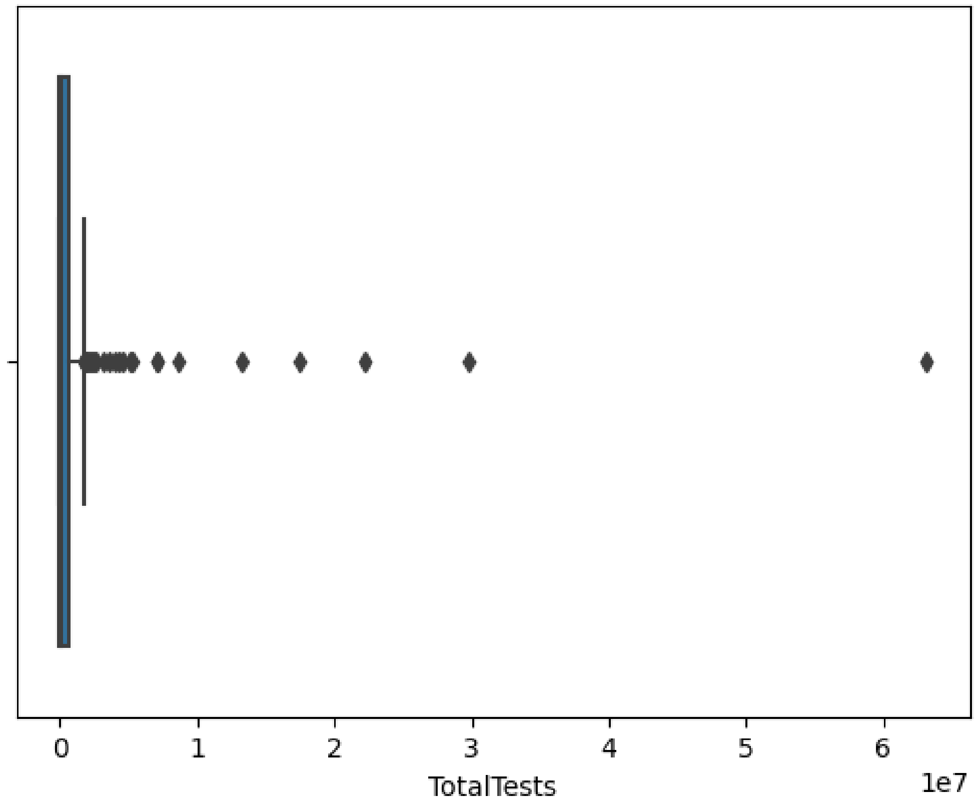
```
[112]: df1.boxplot(column="TotalCases")
```

```
[112]: <Axes: >
```



```
[113]: sns.boxplot(x="TotalTests",data=df1)
```

```
[113]: <Axes: xlabel='TotalTests'>
```

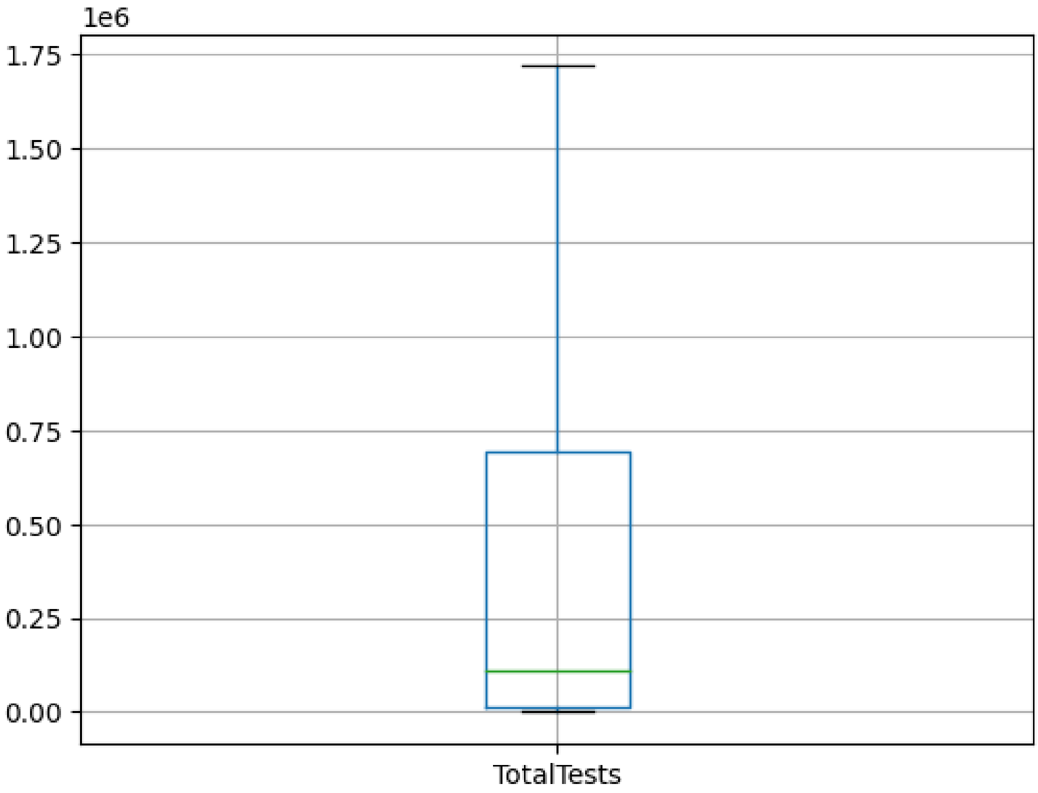


```
[114]: def remove_outlier(col):
           sorted(col)
           Q1,Q3=col.quantile([0.25,0.75])
           IQR=Q3-Q1
           lower_range=Q1-(1.5*IQR)
           upper_range=Q3+(1.5*IQR)
           return lower_range,upper_range
```

```
[115]: low,upp=remove_outlier(df1['TotalTests'])
       df1['TotalTests']=np.where(df1['TotalTests']>upp,upp,df1['TotalTests'])
       df1['TotalTests']=np.where(df1['TotalTests']<low,low,df1['TotalTests'])
```

```
[116]: df1.boxplot(column="TotalTests")
```

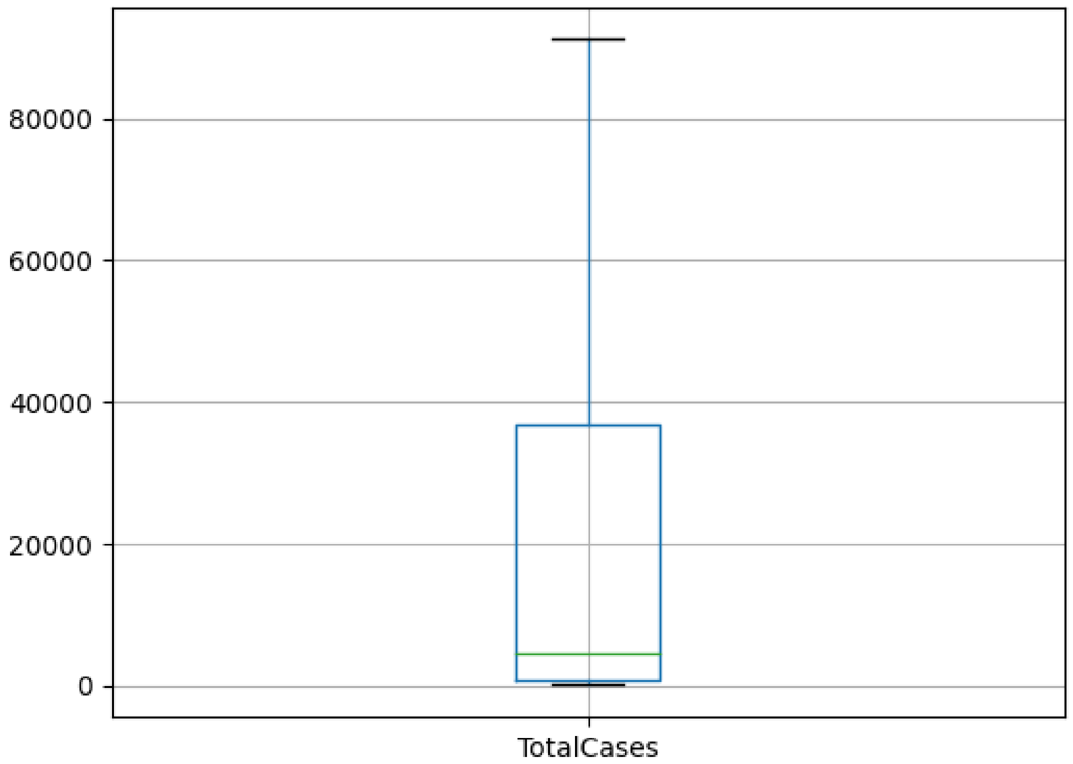
```
[116]: <Axes: >
```



[117]:
```
low,upp=remove_outlier(df1['TotalCases'])
df1['TotalCases']=np.where(df1['TotalCases']>upp,upp,df1['TotalCases'])
df1['TotalCases']=np.where(df1['TotalCases']<low,low,df1['TotalCases'])
```

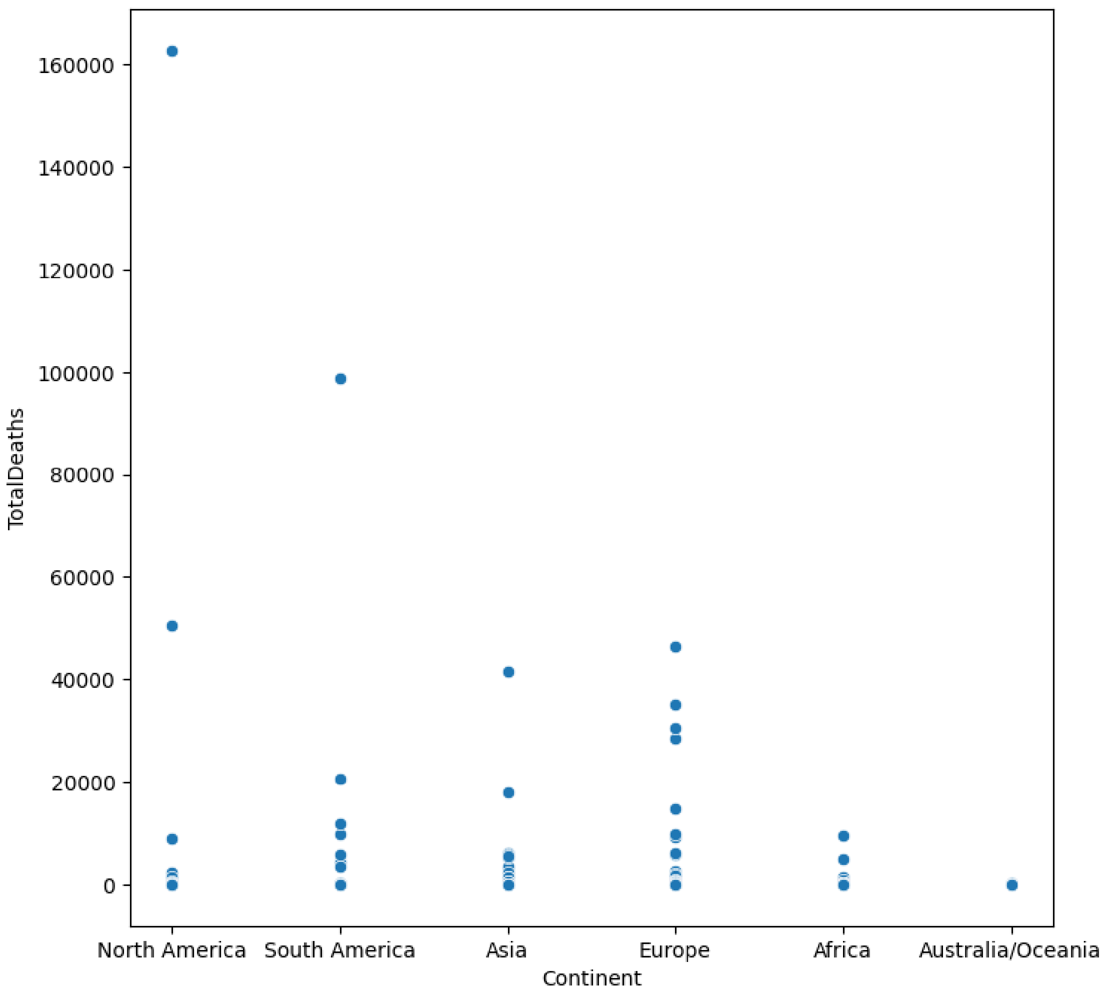
[118]:
```
df1.boxplot(column="TotalCases")
```

[118]:
```
<Axes: >
```



```
[129]: fig, ax = plt.subplots(figsize=(8,8))
       sns.scatterplot(x="Continent",y="TotalDeaths",data=df1,ax=ax)
```

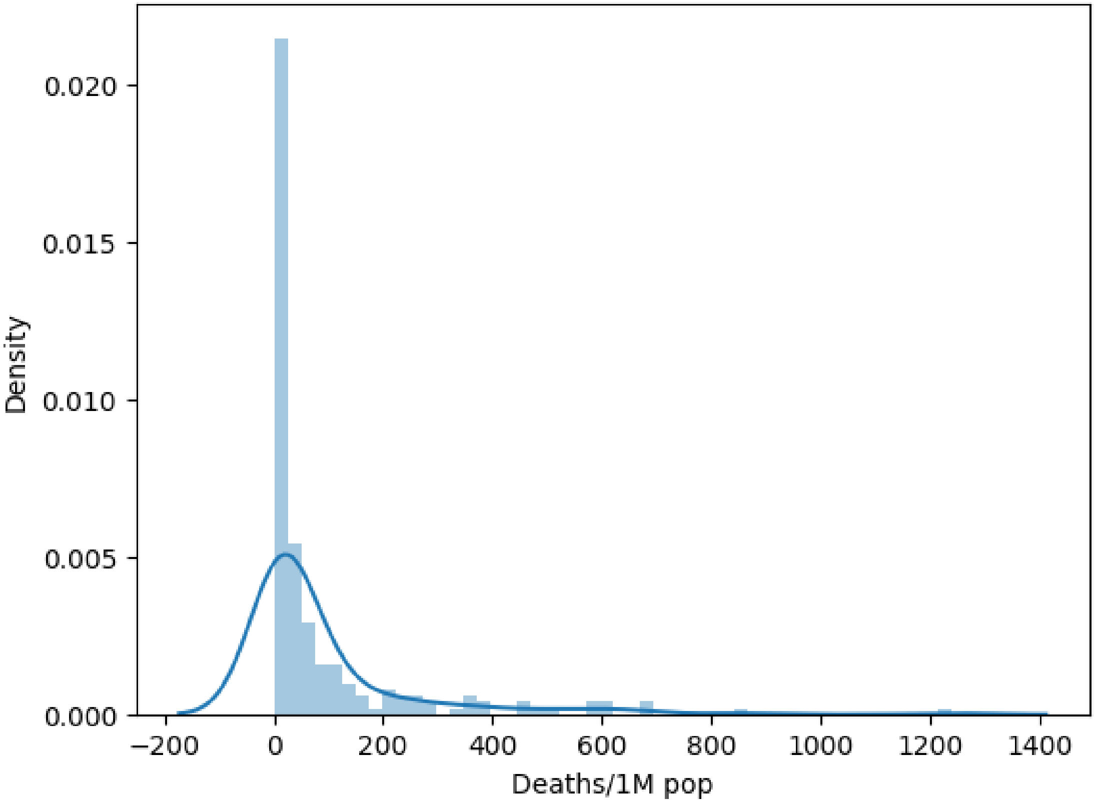
```
[129]: <Axes: xlabel='Continent', ylabel='TotalDeaths'>
```



```
[120]: sns.distplot(df1["Deaths/1M pop"])
```

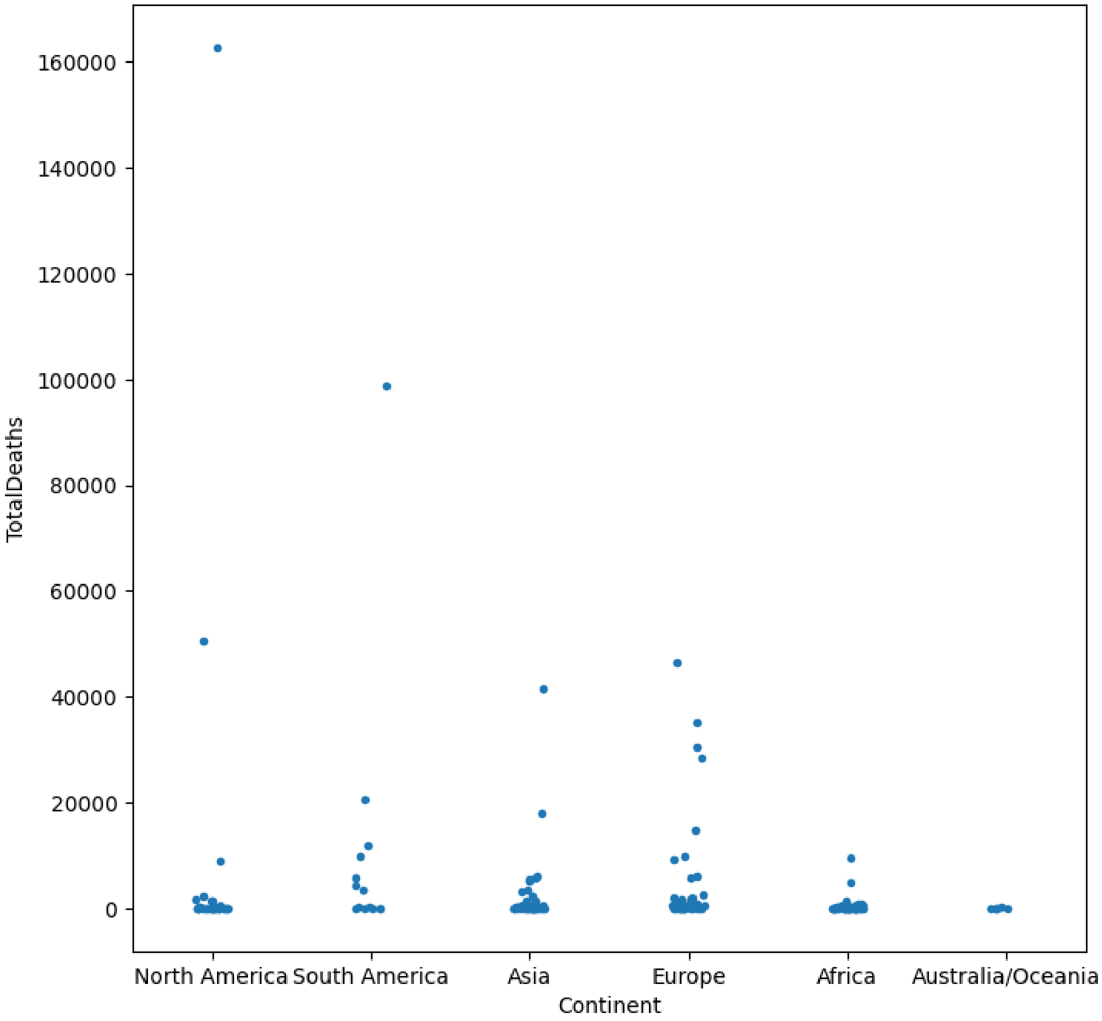
```
C:\Users\sunka\AppData\Local\Temp\ipykernel_7772\3324109747.py:1: UserWarning:

`distplot` is a deprecated function and will be removed in seaborn v0.14.0.

Please adapt your code to use either `displot` (a figure-level function with
similar flexibility) or `histplot` (an axes-level function for histograms).

For a guide to updating your code to use the new functions, please see
https://gist.github.com/mwaskom/de44147ed2974457ad6372750bbe5751

  sns.distplot(df1["Deaths/1M pop"])
```

```
[120]: <Axes: xlabel='Deaths/1M pop', ylabel='Density'>
```



```
[121]: fig, ax = plt.subplots(figsize=(8,8))
       sns.stripplot(x='Continent',y='TotalDeaths',data=df1,ax=ax,size=4)
```

```
[121]: <Axes: xlabel='Continent', ylabel='TotalDeaths'>
```



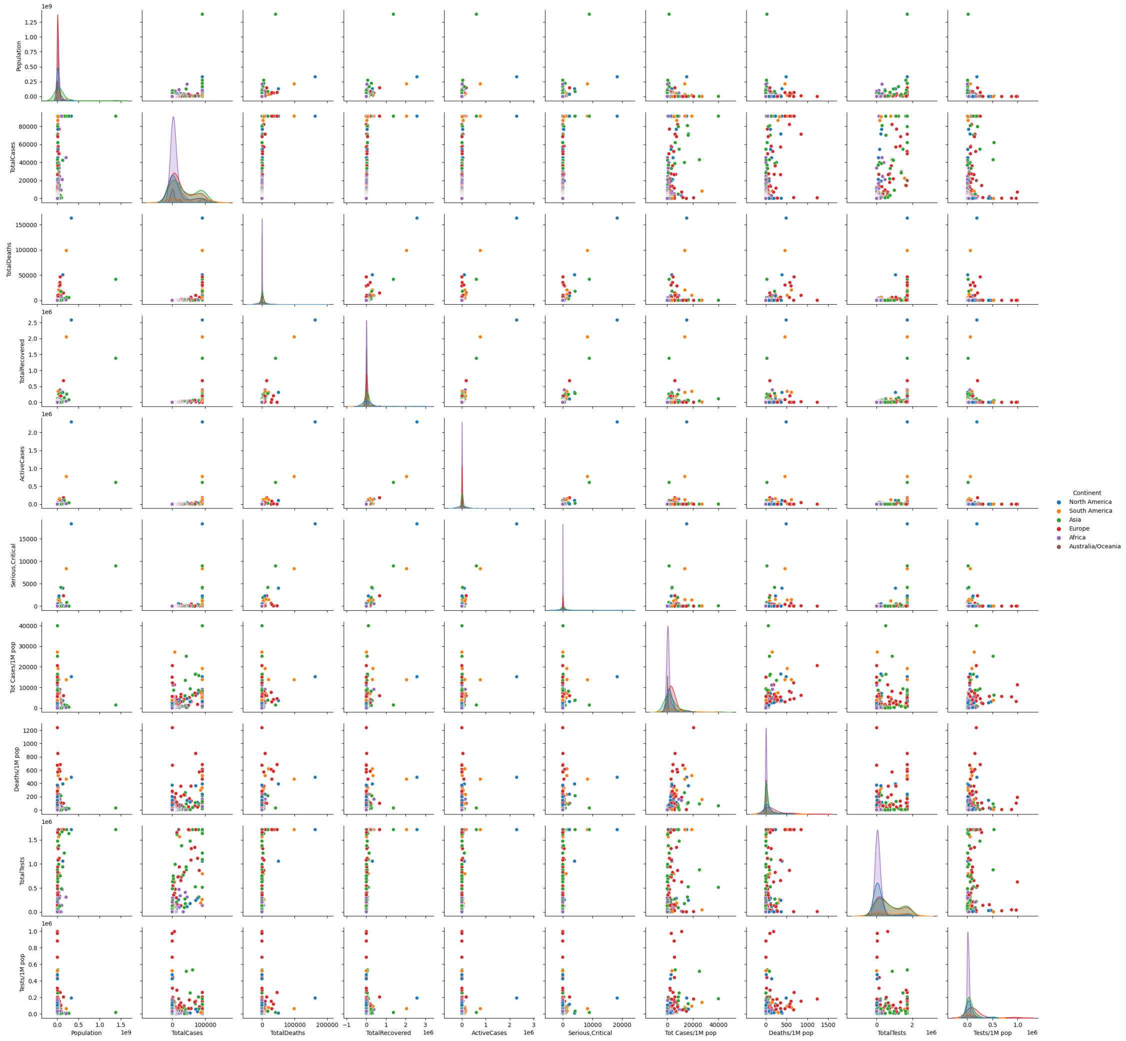
```
[122]: df.head()
```

```
[122]:   Country/Region      Continent    Population  TotalCases  NewCases  \
       0            USA  North America  3.311981e+08     5032179       NaN   
       1         Brazil  South America  2.127107e+08     2917562       NaN   
       2          India           Asia  1.381345e+09     2025409       NaN   
       3         Russia         Europe  1.459409e+08      871894       NaN   
       4   South Africa         Africa  5.938157e+07      538184       NaN   

          TotalDeaths  NewDeaths  TotalRecovered  NewRecovered  ActiveCases  \
       0     162804.0        NaN       2576668.0           NaN    2292707.0   
       1      98644.0        NaN       2047660.0           NaN     771258.0   
       2      41638.0        NaN       1377384.0           NaN     606387.0   
       3      14606.0        NaN        676357.0           NaN     180931.0   
       4       9604.0        NaN        387316.0           NaN     141264.0   
```

```
   Serious,Critical  Tot Cases/1M pop  Deaths/1M pop  TotalTests  \
0           18296.0           15194.0          492.0  63139605.0
1            8318.0           13716.0          464.0  13206188.0
2            8944.0            1466.0           30.0  22149351.0
3            2300.0            5974.0          100.0  29716907.0
4             539.0            9063.0          162.0   3149807.0

   Tests/1M pop      WHO Region
0      190640.0        Americas
1       62085.0        Americas
2       16035.0  South-EastAsia
3      203623.0          Europe
4       53044.0          Africa
```

[123]:
```python
sns.pairplot(df1,hue="Continent")
```

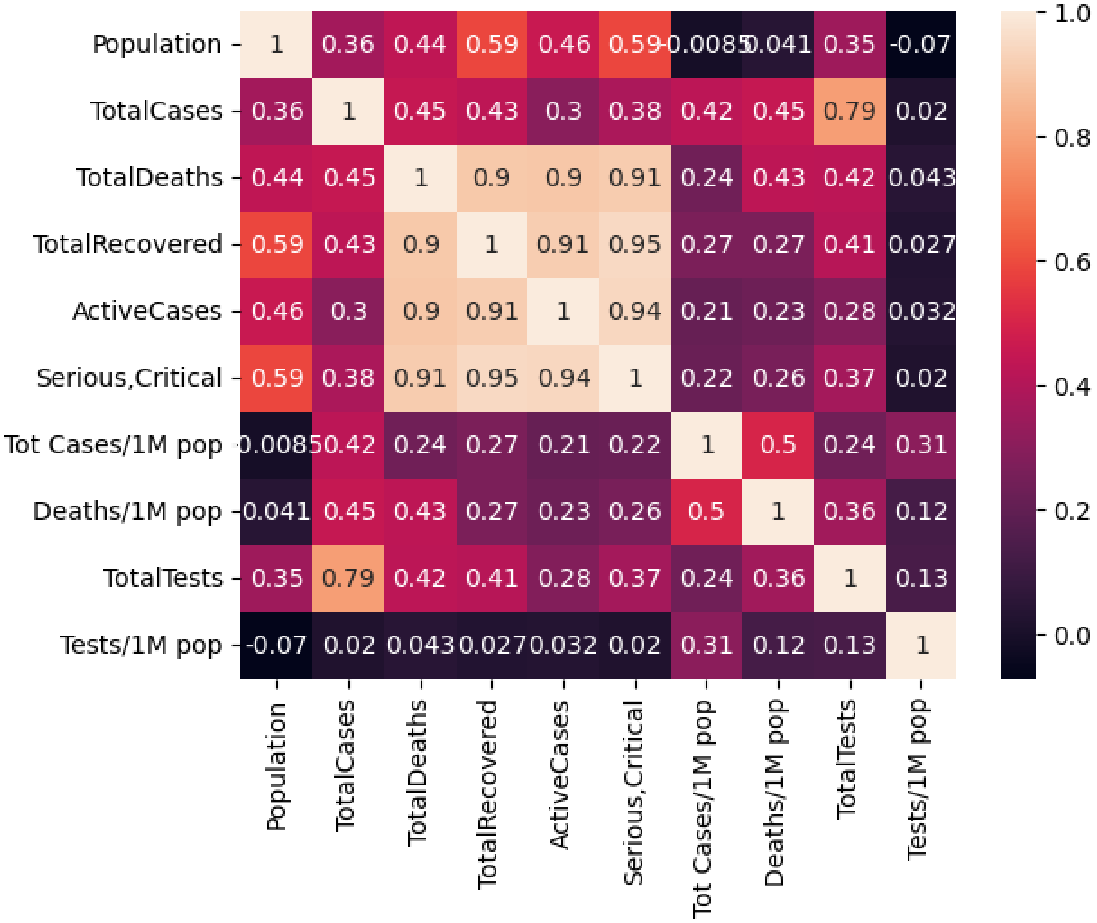
[123]:
```
<seaborn.axisgrid.PairGrid at 0x1541827cdd0>
```



```
[124]: df2=df1.drop(["Country/Region","Continent","WHO Region"],axis=1)
```

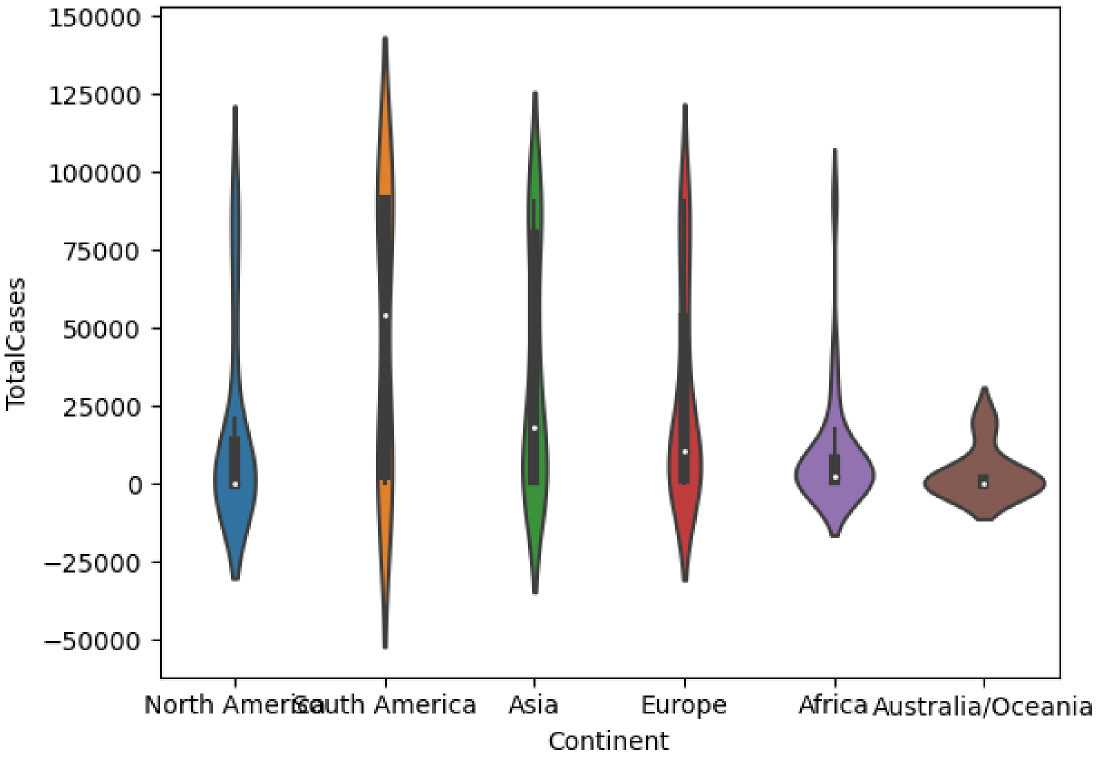
```
[125]: sns.heatmap(df2.corr(),annot=True)
```

```
[125]: <Axes: >
```



```
[126]: sns.violinplot(y="TotalCases",x="Continent",data=df1)
```

```
[126]: <Axes: xlabel='Continent', ylabel='TotalCases'>
```


150000
125000
100000
75000
50000
25000
0
−25000
−50000
TotalCases
North America
South America
Asia
Europe
Africa
Australia/Oceania
Continent

```
[ ]:
```