

```
In [28]: import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns
df = pd.read_csv(r'/Users/jkchinnu/Downloads/world_population.csv')
```

```
In [15]: pd.set_option('display.float.format', lambda x: '%2f' %x)
df
```

Out[15]:

| | Rank | CCA3 | Country | Capital | Continent | 2022 Population | 2020 Population | 2015 Population | 2010 Population | 2000 Population | 1990 Population | 1980 Population | 1970 Population | Area (km²) | Density (per km²) |
|-----|------|------|-------------------|------------------|-----------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|----------------|-------------------|
| 0 | 36 | AFG | Afghanistan | Kabul | Asia | 41128771.000000 | 38972230.000000 | 33753499.000000 | 28189672.000000 | 19542982.000000 | 10694796.000000 | 12486631.000000 | 10752971.000000 | 652230.000000 | 63. |
| 1 | 138 | ALB | Albania | Tirana | Europe | 2842321.000000 | 2866849.000000 | 2882481.000000 | 2913399.000000 | 3182021.000000 | 3295066.000000 | 2941651.000000 | 2324731.000000 | 28748.000000 | 98. |
| 2 | 34 | DZA | Algeria | Algiers | Africa | 44903225.000000 | 43451666.000000 | 39543154.000000 | 35856344.000000 | 30774621.000000 | 25518074.000000 | 18739378.000000 | 13795915.000000 | 2381741.000000 | 18. |
| 3 | 213 | ASM | American Samoa | Pago Pago | Oceania | 44273.000000 | 46189.000000 | 51368.000000 | 54849.000000 | 58230.000000 | 47818.000000 | 32886.000000 | 27075.000000 | 199.000000 | 222. |
| 4 | 203 | AND | Andorra | Andorra la Vella | Europe | 79824.000000 | 77700.000000 | 71746.000000 | 71519.000000 | 66097.000000 | 53569.000000 | 35611.000000 | 19860.000000 | 468.000000 | 170. |
| ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 229 | 226 | WLF | Wallis and Futuna | Mata-Utu | Oceania | 11572.000000 | 11655.000000 | 12182.000000 | 13142.000000 | 14723.000000 | 13454.000000 | 11315.000000 | 9377.000000 | 142.000000 | 81. |
| 230 | 172 | ESH | Western Sahara | El Aaiun | Africa | 575986.000000 | 556048.000000 | 491824.000000 | 413296.000000 | 270375.000000 | 178529.000000 | 116775.000000 | 76371.000000 | 266000.000000 | 2. |
| 231 | 46 | YEM | Yemen | Sanaa | Asia | 33696614.000000 | 32284046.000000 | 28516545.000000 | 24743946.000000 | 18628700.000000 | 13375121.000000 | 9204938.000000 | 6843607.000000 | 527968.000000 | 63. |
| 232 | 63 | ZMB | Zambia | Lusaka | Africa | 20017675.000000 | 18927715.000000 | NaN | 13792086.000000 | 9891136.000000 | 7686401.000000 | 5720438.000000 | 4281671.000000 | 752612.000000 | 26. |
| 233 | 74 | ZWE | Zimbabwe | Harare | Africa | 16320537.000000 | 15669666.000000 | 14154937.000000 | 12839771.000000 | 11834676.000000 | 10113893.000000 | 7049926.000000 | 5202918.000000 | 390757.000000 | 41. |

234 rows × 17 columns

```
In [16]: df.info()

<class 'pandas.core.frame.DataFrame'>
RangeIndex: 234 entries, 0 to 233
Data columns (total 17 columns):
#   Column              Non-Null Count  Dtype  
---  -
0   Rank                 234 non-null   int64   
1   CCA3                 234 non-null   object  
2   Country              234 non-null   object  
3   Capital              234 non-null   object  
4   Continent            234 non-null   object  
5   2022 Population      230 non-null   float64  
6   2020 Population      233 non-null   float64  
7   2015 Population      230 non-null   float64  
8   2010 Population      227 non-null   float64  
9   2000 Population      227 non-null   float64  
10  1990 Population      229 non-null   float64  
11  1980 Population      229 non-null   float64  
12  1970 Population      230 non-null   float64  
13  Area (km²)           232 non-null   float64  
14  Density (per km²)    230 non-null   float64  
15  Growth Rate          232 non-null   float64  
16  World Population Percentage  234 non-null   float64  
dtypes: float64(12), int64(1), object(4)
memory usage: 31.2+ KB
```

```
In [17]: df.groupby('Country').mean().sort_values(by = 'World Population Percentage',ascending = False)
```

Out[17]:

| | Rank | 2022 Population | 2020 Population | 2015 Population | 2010 Population | 2000 Population | 1990 Population | 1980 Population | 1970 Population | Area (km²) | Density (per km²) | Growth Rate |
|------------------|------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|------------------|------------------|----------------|-------------------|-------------|
| Country | | | | | | | | | | | | |
| China | 1.000000 | 1425887337.000000 | 1424929781.000000 | 1393715448.000000 | 1348191368.000000 | 1264099069.000000 | 1153704252.000000 | 982372466.000000 | 822534450.000000 | 9706961.000000 | 146.893300 | 1.000000 |
| India | 2.000000 | 1417173173.000000 | 1396387127.000000 | 1322866505.000000 | 1240613620.000000 | 1059633675.000000 | NaN | NaN | 557501301.000000 | 3287590.000000 | 431.067500 | 1.000000 |
| United States | 3.000000 | 338289857.000000 | 335942003.000000 | 324607776.000000 | 311182845.000000 | 282398554.000000 | 248083732.000000 | 223140018.000000 | 200328340.000000 | 9372610.000000 | 36.093500 | 1.000000 |
| Indonesia | 4.000000 | 275501339.000000 | 271857970.000000 | 259091970.000000 | 244016173.000000 | 214072421.000000 | 182159874.000000 | 148177096.000000 | 115228394.000000 | 1904569.000000 | 144.652900 | 1.000000 |
| Pakistan | 5.000000 | 235824862.000000 | 227196741.000000 | 210969298.000000 | 194454498.000000 | 154369924.000000 | 115414069.000000 | 80624057.000000 | 59290872.000000 | 881912.000000 | 267.401800 | 1.010000 |
| ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Niue | 232.000000 | 1934.000000 | 1942.000000 | 1847.000000 | 1812.000000 | 2074.000000 | 2533.000000 | 3637.000000 | 5185.000000 | 260.000000 | 7.438500 | 0.950000 |
| Bermuda | 206.000000 | 64184.000000 | 64031.000000 | 63144.000000 | 63447.000000 | 61371.000000 | 57470.000000 | 53565.000000 | 52019.000000 | 54.000000 | 1188.592600 | 1.000000 |
| French Guiana | 184.000000 | 304557.000000 | 290969.000000 | 257026.000000 | 228453.000000 | 164351.000000 | 113931.000000 | 66825.000000 | 46484.000000 | 83534.000000 | 3.645900 | 1.020000 |
| French Polynesia | 183.000000 | 306279.000000 | 301920.000000 | 291787.000000 | 283788.000000 | 250927.000000 | 211089.000000 | 163591.000000 | 117891.000000 | 4167.000000 | 73.501100 | 1.000000 |
| Mayotte | 182.000000 | 326101.000000 | 305587.000000 | 249545.000000 | 211786.000000 | 159215.000000 | 92659.000000 | 52233.000000 | 35383.000000 | 374.000000 | 871.927800 | 1.020000 |

234 rows × 13 columns

```
In [33]: df.columns
```

```
Out[33]: Index(['Rank', 'CCA3', 'Country', 'Capital', 'Continent', '2022 Population',
      '2020 Population', '2015 Population', '2010 Population',
      '2000 Population', '1990 Population', '1980 Population',
      '1970 Population', 'Area (km²)', 'Density (per km²)', 'Growth Rate',
      'World Population Percentage'],
      dtype='object')
```

```
In [18]: df2 = df.groupby('Continent')[['2022 Population','2020 Population','2015 Population','2010 Population','2000 Population']].mean().sort_values(by = '2022 Population',ascending = False)
df2 = df.groupby('Continent')[[df.columns[5:10]]].mean().sort_values(by = '2022 Population',ascending = False)
```

Out[18]:

| Continent | 2022 Population | 2020 Population | 2015 Population | 2010 Population | 2000 Population |
|---------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| Asia | 96327387.306122 | 94955134.367347 | 89165003.640000 | 89087770.000000 | 80580835.108696 |
| South America | 31201186.285714 | 30823574.500000 | 29509599.714286 | 26789395.538462 | 25015888.692308 |
| Africa | 25455879.678571 | 23871435.263158 | 21419703.574074 | 18898197.314815 | 14598365.946429 |
| Europe | 15055371.816327 | 14915843.920000 | 15027454.122449 | 14712278.680000 | 14817685.714286 |
| North America | 15007403.400000 | 14855914.825000 | 14259596.250000 | 13568016.275000 | 12151739.600000 |
| Oceania | 2046386.318182 | 1910148.956522 | 1756664.478261 | 1613163.652174 | 1357512.086957 |

```
In [19]: df3 = df2.transpose()
df3
```

Out[19]:

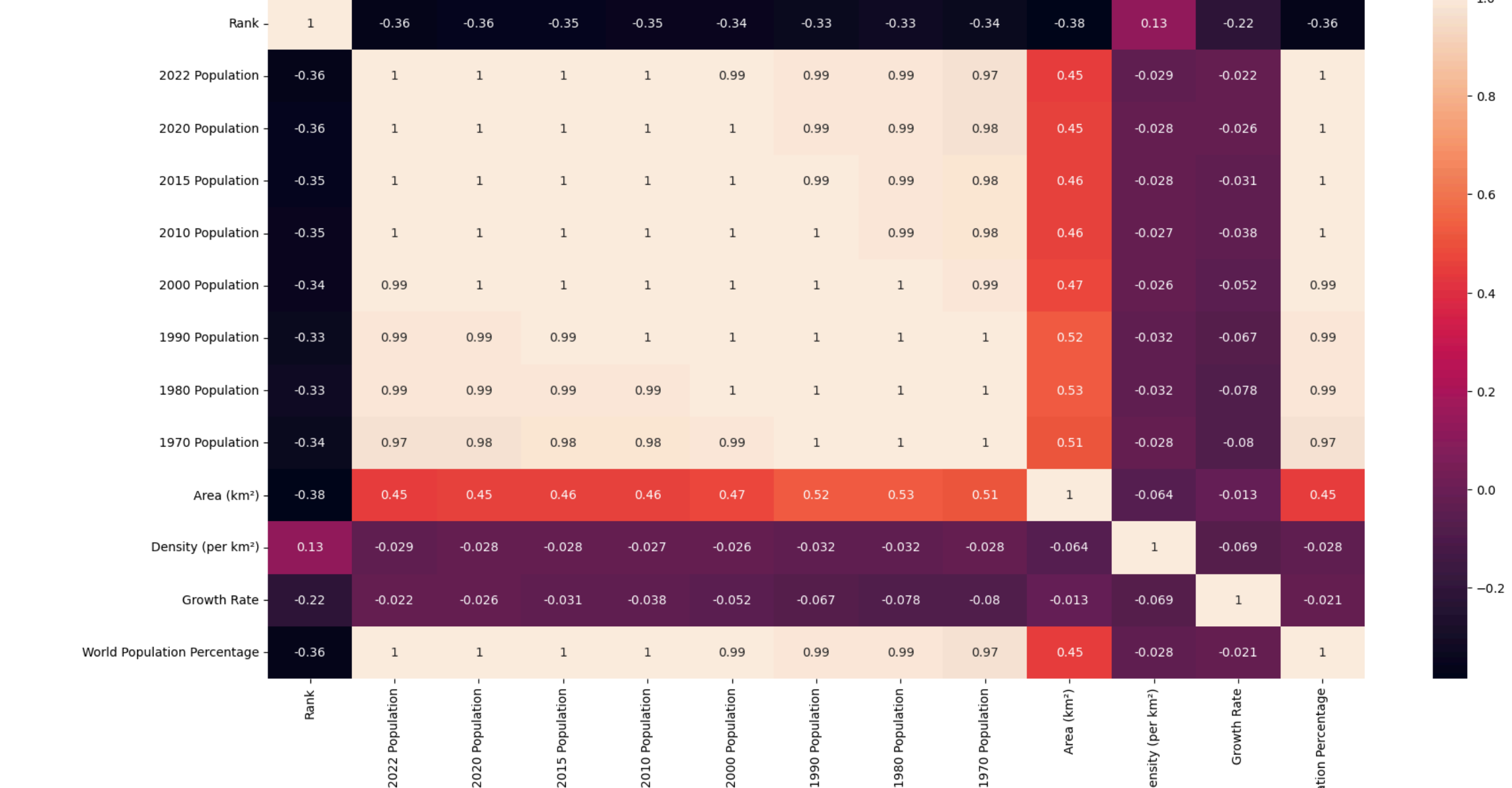
| Continent | Asia | South America | Africa | Europe | North America | Oceania |
|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|----------------|
| 2022 Population | 96327387.306122 | 31201186.285714 | 25455879.678571 | 15055371.816327 | 15007403.400000 | 2046386.318182 |
| 2020 Population | 94955134.367347 | 30823574.500000 | 23871435.263158 | 14915843.920000 | 14855914.825000 | 1910148.956522 |
| 2015 Population | 89165003.640000 | 29509599.714286 | 21419703.574074 | 15027454.122449 | 14259596.250000 | 1756664.478261 |
| 2010 Population | 89087770.000000 | 26789395.538462 | 18898197.314815 | 14712278.680000 | 13568016.275000 | 1613163.652174 |
| 2000 Population | 80580835.108696 | 25015888.692308 | 14598365.946429 | 14817685.714286 | 12151739.600000 | 1357512.086957 |

```
In [26]: df.corr()
```

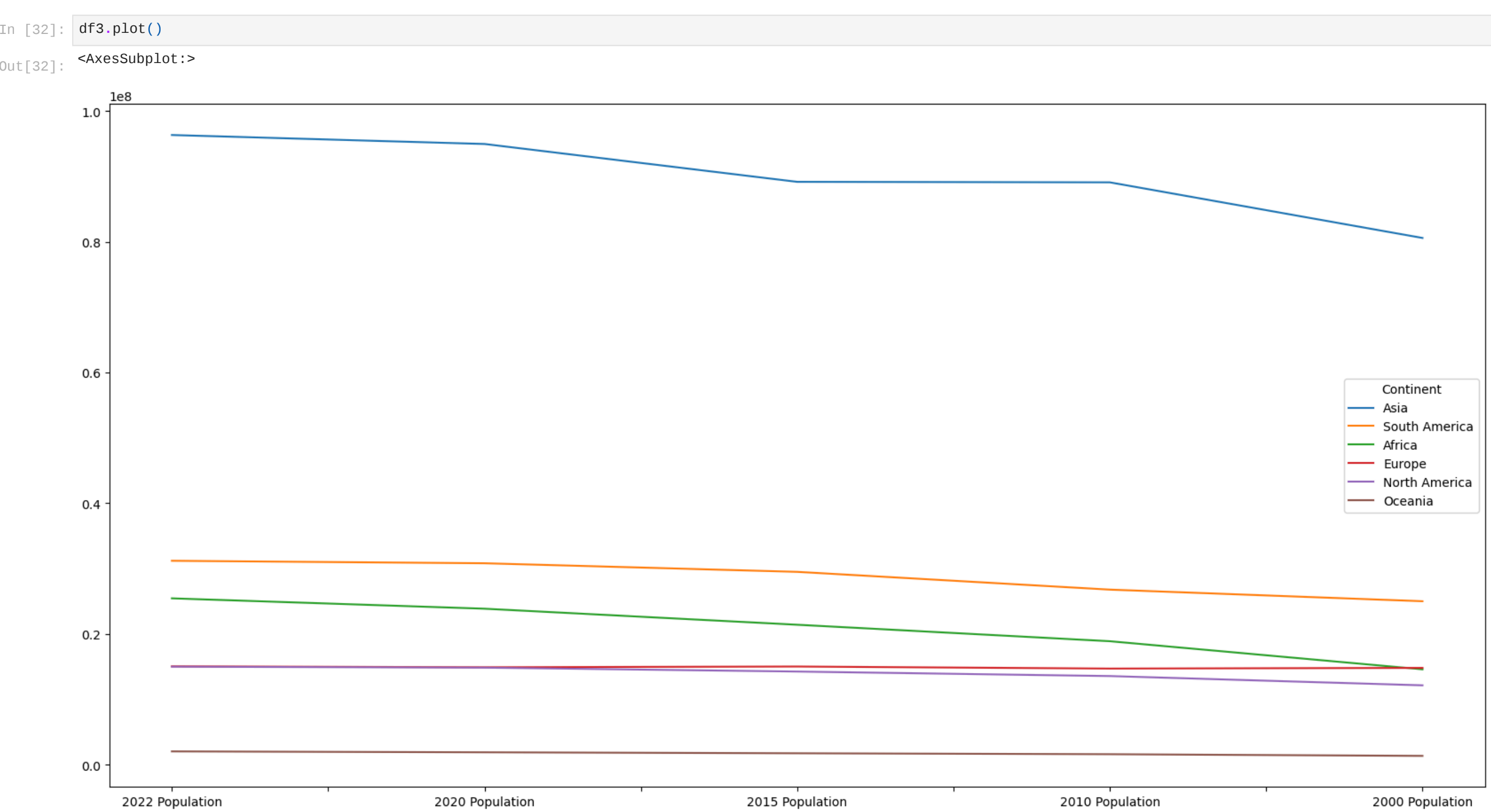
Out[26]:

| | Rank | 2022 Population | 2020 Population | 2015 Population | 2010 Population | 2000 Population | 1990 Population | 1980 Population | 1970 Population | Area (km²) | Density (per km²) | Growth Rate | World Population Percentage |
|-----------------------------|-----------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|------------|-------------------|-------------|-----------------------------|
| Rank | 1.000000 | -0.357989 | -0.356283 | -0.352850 | -0.350009 | -0.342095 | -0.333014 | -0.328620 | -0.335737 | -0.384854 | 0.128994 | -0.220197 | -0.358464 |
| 2022 Population | -0.357989 | 1.000000 | 0.999946 | 0.999492 | 0.998633 | 0.994602 | 0.991124 | 0.986675 | 0.973135 | 0.452812 | -0.028761 | -0.022059 | 0.999999 |
| 2020 Population | -0.356283 | 0.999946 | 1.000000 | 0.999764 | 0.999108 | 0.995582 | 0.992557 | 0.988392 | 0.975245 | 0.454902 | -0.027802 | -0.025976 | 0.999944 |
| 2015 Population | -0.352850 | 0.999492 | 0.999764 | 1.000000 | 0.999784 | 0.994968 | 0.991346 | 0.979413 | 0.458101 | -0.027740 | -0.031150 | -0.094598 | 0.999489 |
| 2010 Population | -0.350009 | 0.998633 | 0.999108 | 0.999784 | 1.000000 | 0.998595 | 0.996716 | 0.993628 | 0.983050 | 0.461498 | -0.026635 | -0.038262 | 0.998630 |
| 2000 Population | -0.342095 | 0.994602 | 0.995582 | 0.997343 | 0.998595 | 1.000000 | 0.999192 | 0.997247 | 0.990959 | 0.473137 | -0.026341 | -0.052041 | 0.994598 |
| 1990 Population | -0.333014 | 0.991124 | 0.992557 | 0.994968 | 0.996716 | 0.999192 | 1.000000 | 0.999257 | 0.997158 | 0.524392 | -0.032348 | -0.066718 | 0.991102 |
| 1980 Population | -0.328620 | 0.986675 | 0.988392 | 0.991346 | 0.993628 | 0.997247 | 0.999257 | 1.000000 | 0.999251 | 0.530726 | -0.032167 | -0.077794 | 0.986652 |
| 1970 Population | -0.335737 | 0.973135 | 0.975245 | 0.979413 | 0.983050 | 0.990959 | 0.997158 | 0.999251 | 1.000000 | 0.509942 | -0.027523 | -0.080020 | 0.973143 |
| Area (km²) | -0.384854 | 0.452812 | 0.454902 | 0.458101 | 0.461498 | 0.473137 | 0.524392 | 0.530726 | 0.509942 | 1.000000 | -0.063545 | -0.012829 | 0.453305 |
| Density (per km²) | 0.128994 | -0.028761 | -0.028635 | -0.027740 | -0.026635 | -0.026341 | -0.032348 | -0.032167 | -0.027523 | -0.063545 | 1.000000 | -0.068923 | -0.027957 |
| Growth Rate | -0.220197 | -0.022059 | -0.025976 | -0.031150 | -0.038262 | -0.052041 | -0.066718 | -0.077794 | -0.080020 | -0.012829 | -0.068923 | 1.000000 | -0.021495 |
| World Population Percentage | -0.358464 | 0.999999 | 0.999944 | 0.999489 | 0.998630 | 0.994598 | 0.991102 | 0.986652 | 0.973143 | 0.453305 | -0.027957 | -0.021495 | 1.000000 |

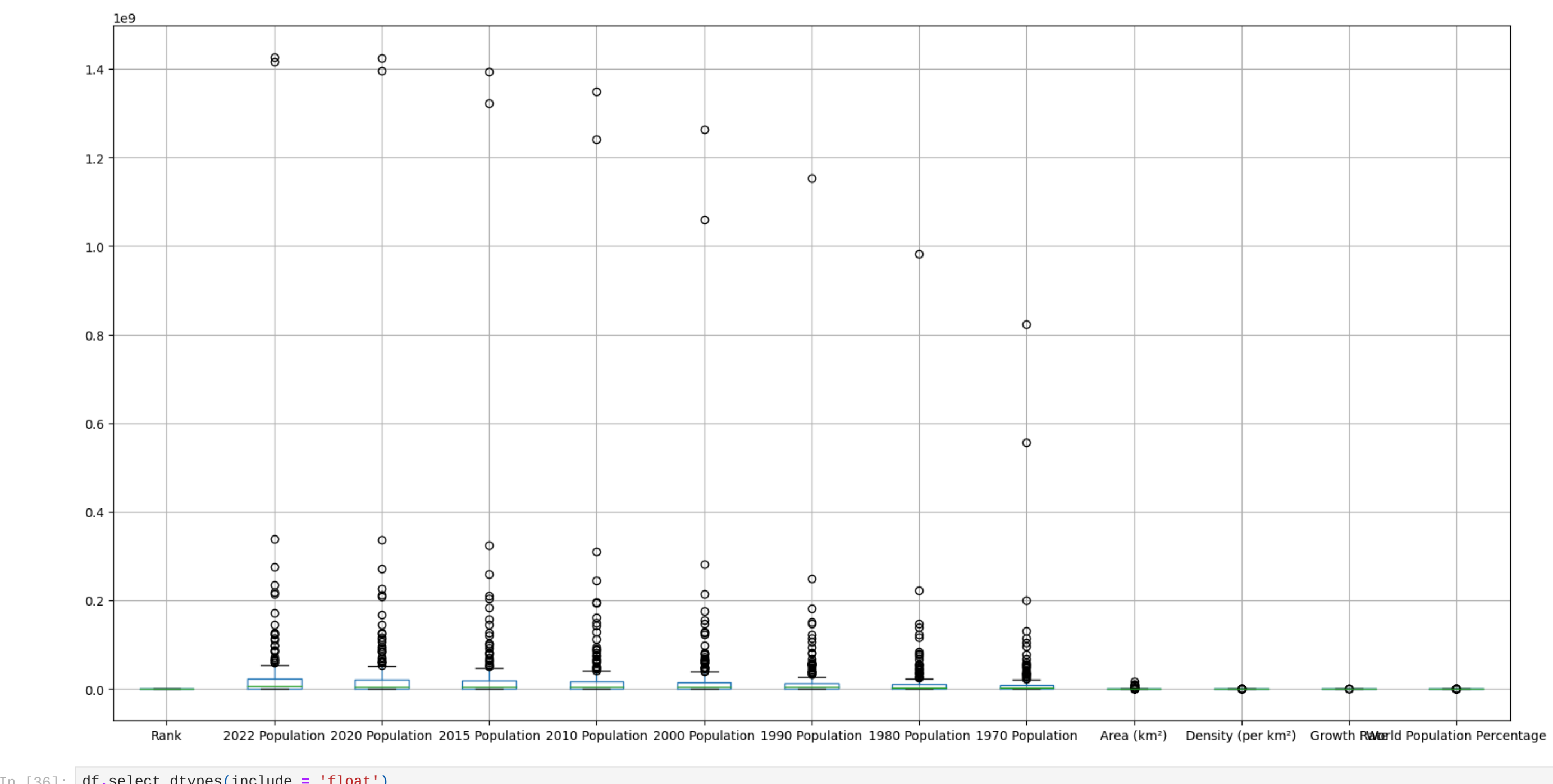
```
In [30]: sns.heatmap(df.corr(),annot = True)
plt.rcParams['figure.figsize'] = (20,10)
plt.show()
```



```
In [32]: df3.plot()
```



```
In [34]: df.boxplot(figsize = (20,10))
```



```
In [36]: df.select_dtypes(include = 'float')
```

| | | | | | | | | | | | | |
|-----------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|----------------|------------|----------|----------|
| 0 | 41128771.000000 | 38972230.000000 | 33753499.000000 | 28189672.000000 | 19542982.000000 | 10694796.000000 | 12486631.000000 | 10752971.000000 | 652230.000000 | 63.058700 | 1.025700 | 0.520000 |
| 1 | 2842321.000000 | 2866849.000000 | 2882481.000000 | 2913399.000000 | 3182021.000000 | 3295066.000000 | 2941651.000000 | 2324731.000000 | 28748.000000 | 98.870200 | 0.995700 | 0.040000 |
| 2 | 44903225.000000 | 43451666.000000 | 39543154.000000 | 35856344.000000 | 30774621.000000 | 25518074.000000 | 18739378.000000 | 13795915.000000 | 2381741.000000 | 18.853100 | 1.016400 | 0.560000 |
| 3 | 44273.000000 | 46189.000000 | 51368.000000 | 54849.000000 | 58230.000000 | 47818.000000 | 32886.000000 | 27075.000000 | 199.000000 | 222.477400 | 0.983100 | 0.000000 |
| 4 | 79824.000000 | 77700.000000 | 71746.000000 | 71519.000000 | 66097.000000 | 53569.000000 | 35611.000000 | 19860.000000 | 468.000000 | 170.564100 | 1.010000 | 0.000000 |
| ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 229 | 11572.000000 | 11655.000000 | 12182.000000 | 13142.000000 | 14723.000000 | 13454.000000 | 11315.000000 | 9377.000000 | 142.000000 | 81.493000 | 0.995300 | 0.000000 |
| 230 | 575986.000000 | 556048.000000 | 491824.000000 | 413296.000000 | 270375.000000 | 178529.000000 | 116775.000000 | 76371.000000 | 266000.000000 | 2.165400 | 1.018400 | 0.010000 |
| 231 | 33696614.000000 | 32284046.000000 | 28516545.000000 | 24743946.000000 | 18628700.000000 | 13375121.000000 | 9204938.000000 | 6843607.000000 | 527968.000000 | 63.823200 | 1.021700 | 0.420000 |
| 232 | 20017675.000000 | 18927715.000000 | Na/N | 13792086.000000 | 9891136.000000 | 7686401.000000 | 5720438.000000 | 4281671.000000 | 752612.000000 | 26.597600 | 1.028000 | 0.250000 |
| 233 | 16320537.000000 | 15669666.000000 | 14514937.000000 | 12839771.000000 | 11834676.000000 | 10113893.000000 | 7049926.000000 | 5202918.000000 | 390757.000000 | 41.766500 | 1.020400 | 0.200000 |
| 234 rows × 12 columns | | | | | | | | | | | | |