

# PYTHON ASSIGNMENT - 8 : DATA VISUALIZATION

## Exercise 1:

Create a line plot using matplotlib pyplot that displays the population of four different cities over time. Each city should have its own line, and the x-axis should represent years (e.g. 2010, 2011, 2012, etc.) while the y-axis should represent the population.

The data for the four cities is provided below:

City A: [500000, 550000, 600000, 650000, 700000, 750000, 800000]

City B: [800000, 850000, 900000, 950000, 1000000, 1050000, 1100000]

City C: [1000000, 1050000, 1100000, 1150000, 1200000, 1250000, 1300000]

City D: [1200000, 1250000, 1300000, 1350000, 1400000, 1450000, 1500000]

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JupyterLab Python 3 (ipykernel)

In [1]: # Exercise 1:
# Create a line plot using matplotlib pyplot that displays the population of four different cities over
# time. Each city should have its own line, and the x-axis should represent years (e.g. 2010, 2011, 2012,
# etc.) while the y-axis should represent the population.
# The data for the four cities is provided below:
# City A: [500000, 550000, 600000, 650000, 700000, 750000, 800000]
# City B: [800000, 850000, 900000, 950000, 1000000, 1050000, 1100000]
# City C: [1000000, 1050000, 1100000, 1150000, 1200000, 1250000, 1300000]
# City D: [1200000, 1250000, 1300000, 1350000, 1400000, 1450000, 1500000]

import matplotlib.pyplot as plt

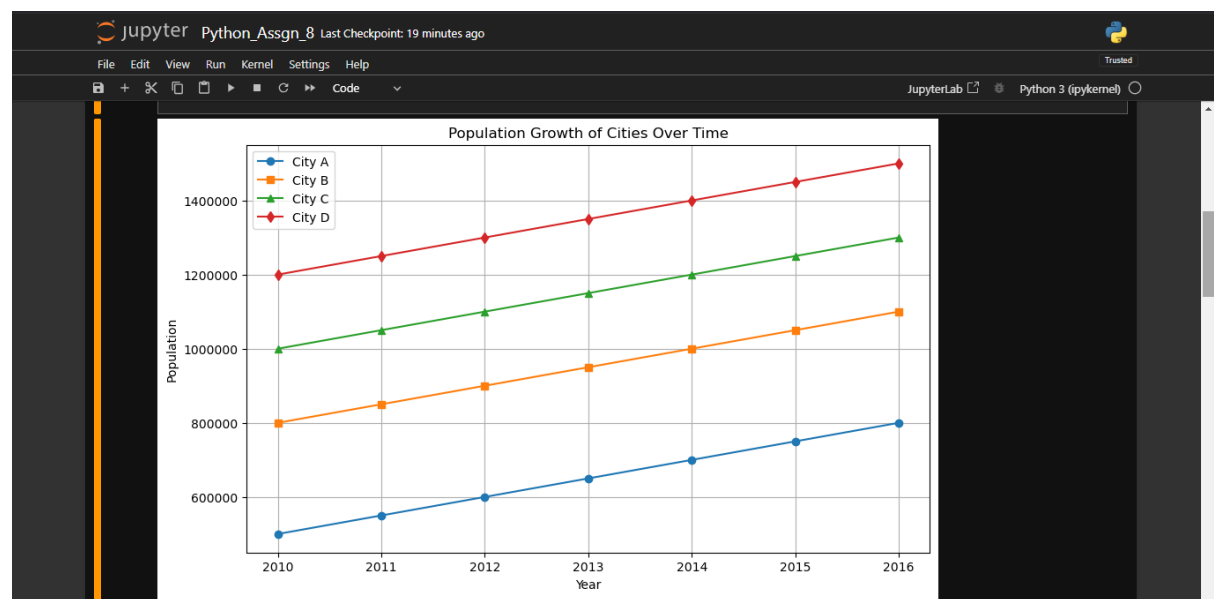
years = [2010, 2011, 2012, 2013, 2014, 2015, 2016]
city_a_population = [500000, 550000, 600000, 650000, 700000, 750000, 800000]
city_b_population = [800000, 850000, 900000, 950000, 1000000, 1050000, 1100000]
city_c_population = [1000000, 1050000, 1100000, 1150000, 1200000, 1250000, 1300000]
city_d_population = [1200000, 1250000, 1300000, 1350000, 1400000, 1450000, 1500000]

plt.figure(figsize=(10, 6))
plt.plot(years, city_a_population, marker='o', linestyle='-', label='City A')
plt.plot(years, city_b_population, marker='s', linestyle='-', label='City B')
plt.plot(years, city_c_population, marker='^', linestyle='-', label='City C')
plt.plot(years, city_d_population, marker='d', linestyle='-', label='City D')

plt.xlabel('Year')
plt.ylabel('Population')
plt.title('Population Growth of Cities Over Time')
plt.legend()
plt.grid(True)

plt.ticklabel_format(style='plain', axis='y')

plt.show()
```



## Exercise 2:

Create a scatter plot using seaborn that shows the relationship between the number of hours studied and the test scores obtained by a group of students. Use the following data:

Hours Studied: [1, 2, 3, 4, 5, 6, 7, 8, 9, 10]

Test Scores: [93, 57, 61, 54, 51, 53, 87, 81, 83, 85]

```
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+ %> Code
year

[3]: # Exercise 2:
      # Create a scatter plot using seaborn that shows the relationship between the number of hours
      # studied and the test scores obtained by a group of students. Use the following data:
      # Hours Studied: [1, 2, 3, 4, 5, 6, 7, 8, 9, 10]
      # Test Scores: [93, 57, 61, 54, 51, 53, 87, 81, 83, 85]

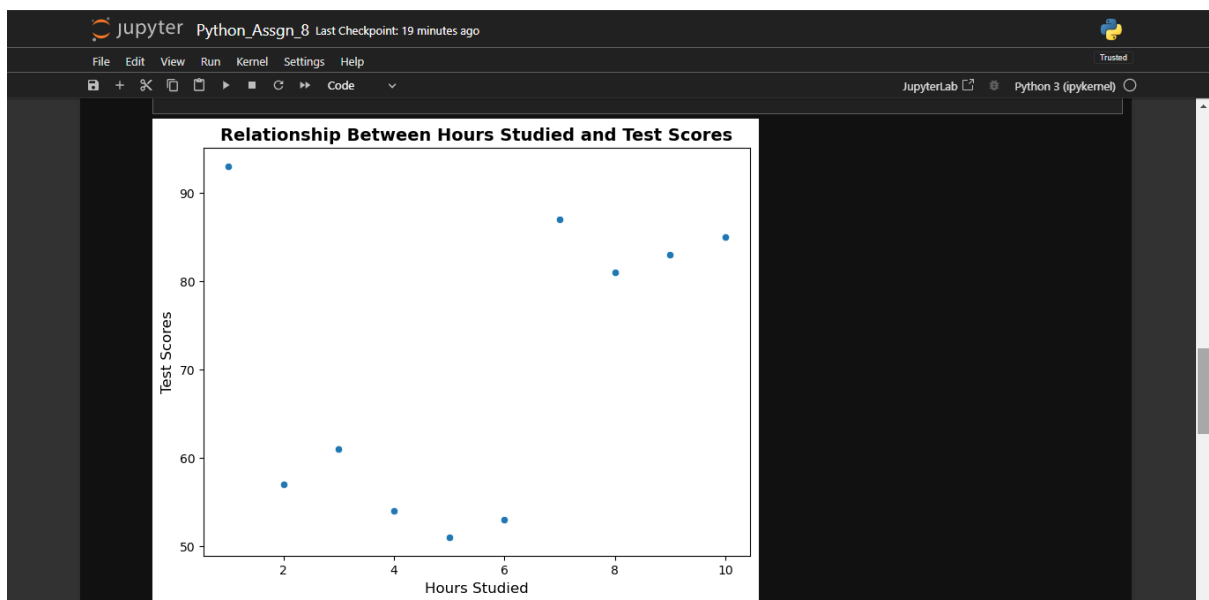
      import seaborn as sns
      import matplotlib.pyplot as plt

      hours_studied = [1, 2, 3, 4, 5, 6, 7, 8, 9, 10]
      test_scores = [93, 57, 61, 54, 51, 53, 87, 81, 83, 85]

      plt.figure(figsize=(8, 6))
      sns.scatterplot(x=hours_studied, y=test_scores)

      plt.xlabel('Hours Studied', fontsize=12)
      plt.ylabel('Test Scores', fontsize=12)
      plt.title('Relationship Between Hours Studied and Test Scores', fontsize=14, fontweight='bold')

      plt.show()
```



### Exercise 3:

Create a bar chart using matplotlib pyplot that shows the total sales for each month of the year. Use the following data:

Month: ["Jan", "Feb", "Mar", "Apr", "May", "Jun", "Jul", "Aug", "Sep", "Oct", "Nov", "Dec"]

Sales: [11860, 10480, 4997, 5523, 13965, 6011, 13158, 9533, 5158, 9058, 11346, 6675]

```
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Hours Studied

[5]: # Exercise 3:
# Create a bar chart using matplotlib pyplot that shows the total sales for each month of the year. Use
# the following data:
# Month: ["Jan", "Feb", "Mar", "Apr", "May", "Jun", "Jul", "Aug", "Sep", "Oct", "Nov", "Dec"]
# Sales: [11860, 10480, 4997, 5523, 13965, 6011, 13158, 9533, 5158, 9058, 11346, 6675]

import matplotlib.pyplot as plt

months = ["Jan", "Feb", "Mar", "Apr", "May", "Jun", "Jul", "Aug", "Sep", "Oct", "Nov", "Dec"]
sales = [11860, 10480, 4997, 5523, 13965, 6011, 13158, 9533, 5158, 9058, 11346, 6675]

plt.figure(figsize=(10, 6))
plt.bar(months, sales, color='royalblue')

plt.xlabel('Month', fontsize=12)
plt.ylabel('Total Sales', fontsize=12)
plt.title('Total Sales Per Month', fontsize=14, fontweight='bold')

plt.show()
```

