

## Python Matplotlib Exercise (100 points)

Course Code : **CPE 031**Program : **BSCPE**

Course Title : **Visualizations and Data Analysis**

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Section : **CPE21S4**

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**1. Use the following csv file for this exercise**

✓ 1. Use the following csv file for this exercise

```
import matplotlib.pyplot as plt
import numpy as np
import pandas as pd
from google.colab import files
uploaded = files.upload()
```

Choose Files Technologic...le-Data.csv

- **Technological-Products-Sample-Data.csv**(text/csv) - 1462 bytes, last modified: 10/29/2024 - 100% done

Saving Technological-Products-Sample-Data.csv to Technological-Products-Sample-Data.csv



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Saving Technological-Products-Sample-Data.csv to Technological-Products-Sample-Data.csv

```
data = pd.read_csv('Technological-Products-Sample-Data.csv')
df = pd.DataFrame(data)
df
```

	Brand	Device	Model	Country of Origin	Date of Release	Price (USD)
0	Apple	iPhone	13 Pro Max	United States	9/24/2021	1099
1	Samsung	Galaxy	S21 Ultra	South Korea	1/29/2021	1199
2	Google	Pixel	6 Pro	United States	10/19/2021	899
3	Sony	PlayStation	5	Japan	11/12/2020	499
4	Microsoft	Surface	Laptop 4	United States	4/15/2021	999
5	Dell	XPS	13	United States	1/28/2021	999
6	HP	Spectre	x360	United States	4/16/2021	1349
7	Lenovo	ThinkPad	X1 Carbon	China	2/15/2021	1429
8	Asus	ROG	Zephyrus G14	Taiwan	3/15/2021	1499
9	Acer	Predator	Helios 300	Taiwan	2/17/2021	1299
10	Apple	MacBook	Pro 14-inch	United States	10/26/2021	1999
11	Samsung	Odyssey	G9	South Korea	7/22/2020	1699
12	Google	Pixelbook	Go	United States	6/17/2021	649
13	Sony	Xperia	1 III	Japan	8/19/2021	1299
14	Microsoft	Xbox	Series X	United States	11/10/2020	499
15	Dell	Alienware	m15 R5	United States	4/20/2021	1999
16	HP	Pavilion	x360	United States	5/14/2021	749
17	Lenovo	IdeaPad	5 Pro	China	3/10/2021	999
18	Asus	ZenBook	14	Taiwan	1/15/2021	799
19	Acer	Swift	3	Taiwan	2/10/2021	699
20	Apple	iPad	Pro 12.9-inch	United States	5/21/2021	1099
21	Samsung	Galaxy	Tab S7+	South Korea	8/21/2020	849
22	Google	Nest	Hub Max	United States	3/30/2021	229
23	Sony	WH	1000XM4	Malaysia	8/6/2020	349
24	Microsoft	Surface	Pro 8	United States	10/5/2021	899
25	Dell	UltraSharp	U2720Q	China	12/25/2020	499
26	HP	Elite	Dragonfly	United States	6/28/2021	1799
27	Lenovo	Legion	7i	China	4/5/2021	1499
28	Asus	TUF	Gaming A15	Taiwan	3/20/2021	1199
29	Acer	Aspire	5	Taiwan	1/30/2021	599

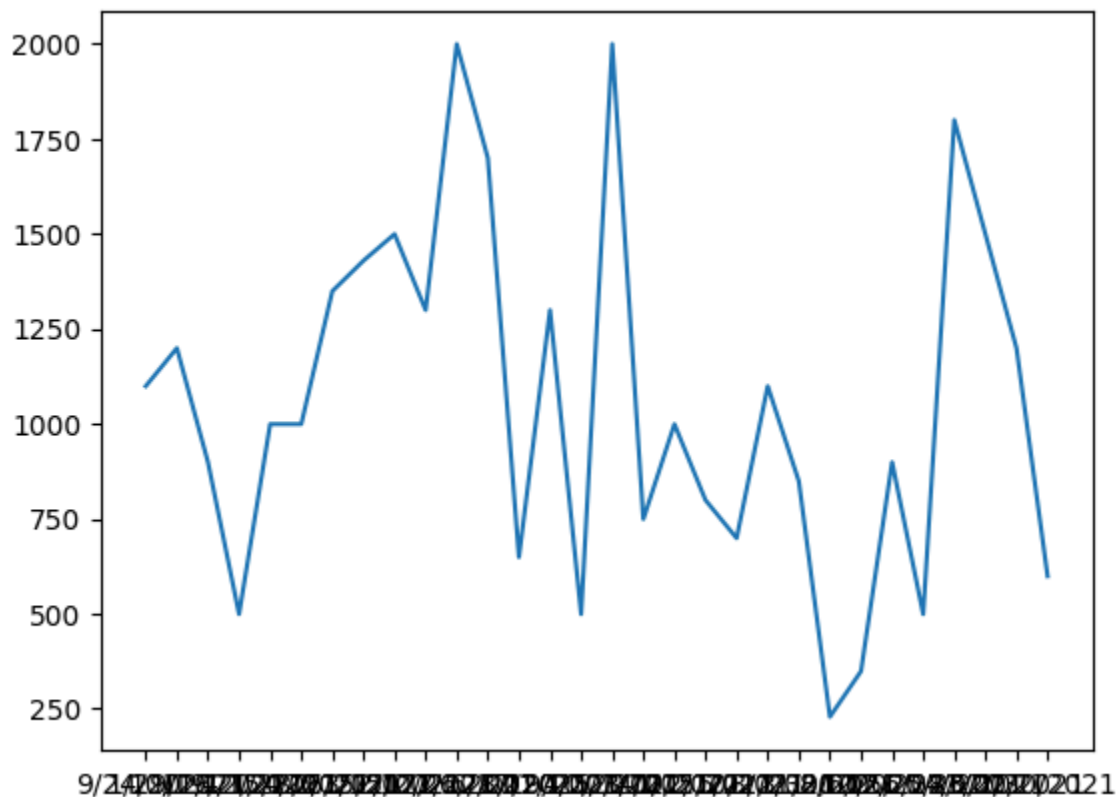
### 3. Analyze the data and generate the appropriate plot including its properties:

a. Read each device's date of release and sales. Show it using a line plot.

```
data = pd.read_csv("Technological-Products-Sample-Data.csv")
df = pd.DataFrame(data)

x1 = df["Date of Release"]
y1 = df["Price (USD)"]

plt.plot(x1, y1)
plt.show()
```



b. Get the total sales and show line plot with the following style properties.

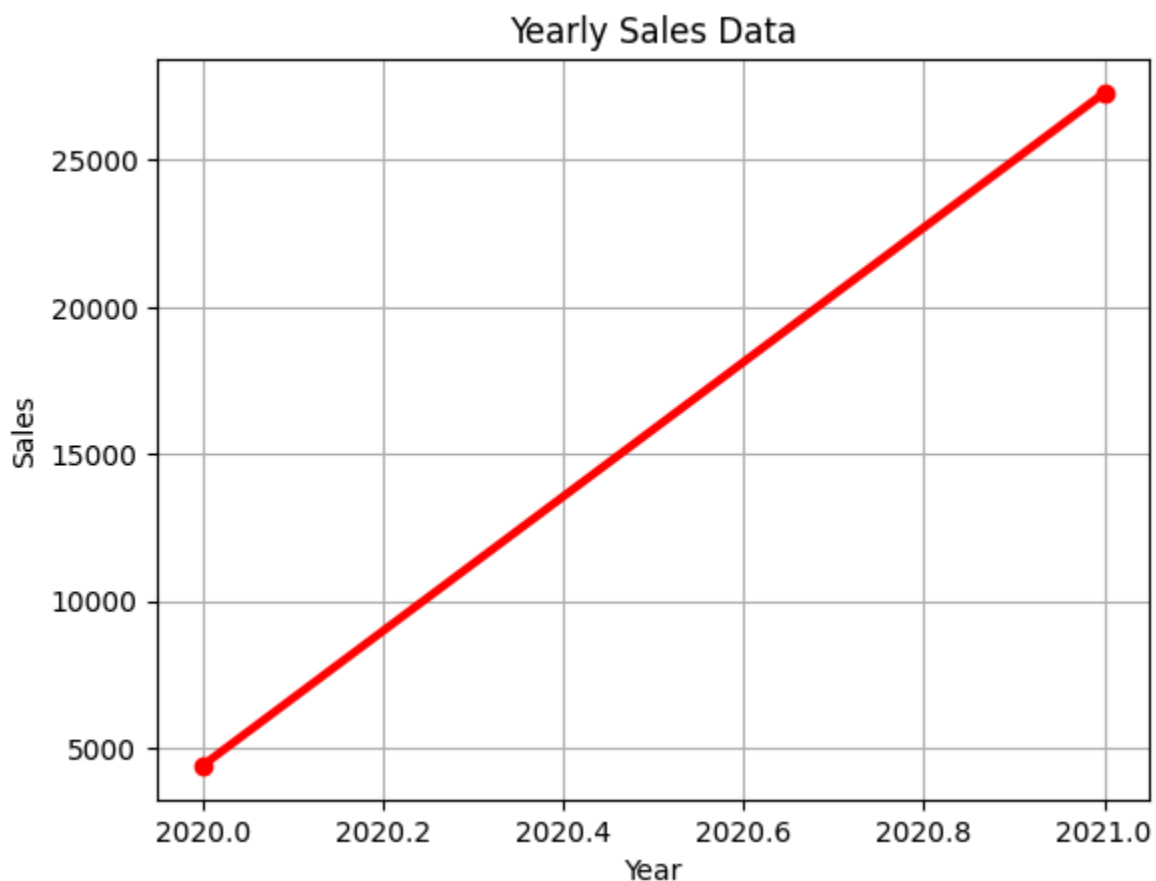
```

# To get the year from the date of release so that the x-axis will not be overly cluttered...
df["Date of Release"] = pd.to_datetime(df["Date of Release"])
df["year"] = df["Date of Release"].dt.year

yearly_sales = df.groupby('year')['Price (USD)'].sum()
x_axis_year = yearly_sales.index
y_axis_sales = yearly_sales.values

plt.plot(x_axis_year, y_axis_sales, marker='o', color='red', linewidth=3)
plt.xlabel("Year")
plt.ylabel("Sales")
plt.title("Yearly Sales Data")
plt.grid()
plt.show()

```



**c. Read all product sales data and show it using a multiline plot. Label them.**

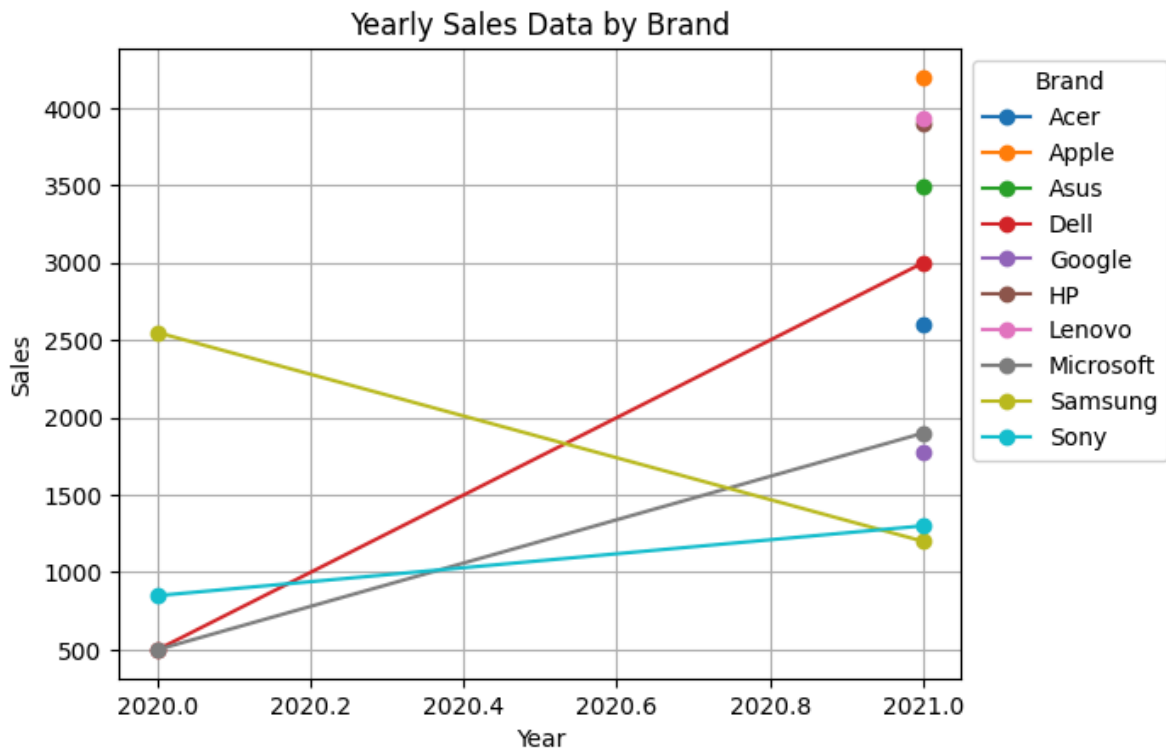
```

df["Date of Release"] = pd.to_datetime(df["Date of Release"])
df["year"] = df['Date of Release'].dt.year

yearly_sales = df.groupby(['year', 'Brand'])['Price (USD)'].sum().unstack()
for brand in yearly_sales.columns:
    plt.plot(yearly_sales.index, yearly_sales[brand], marker='o', label=brand)

plt.xlabel("Year")
plt.ylabel("Sales")
plt.title("Yearly Sales Data by Brand")
plt.legend(title='Brand', loc='upper left', bbox_to_anchor=(1, 1))
plt.grid()
plt.show()

```

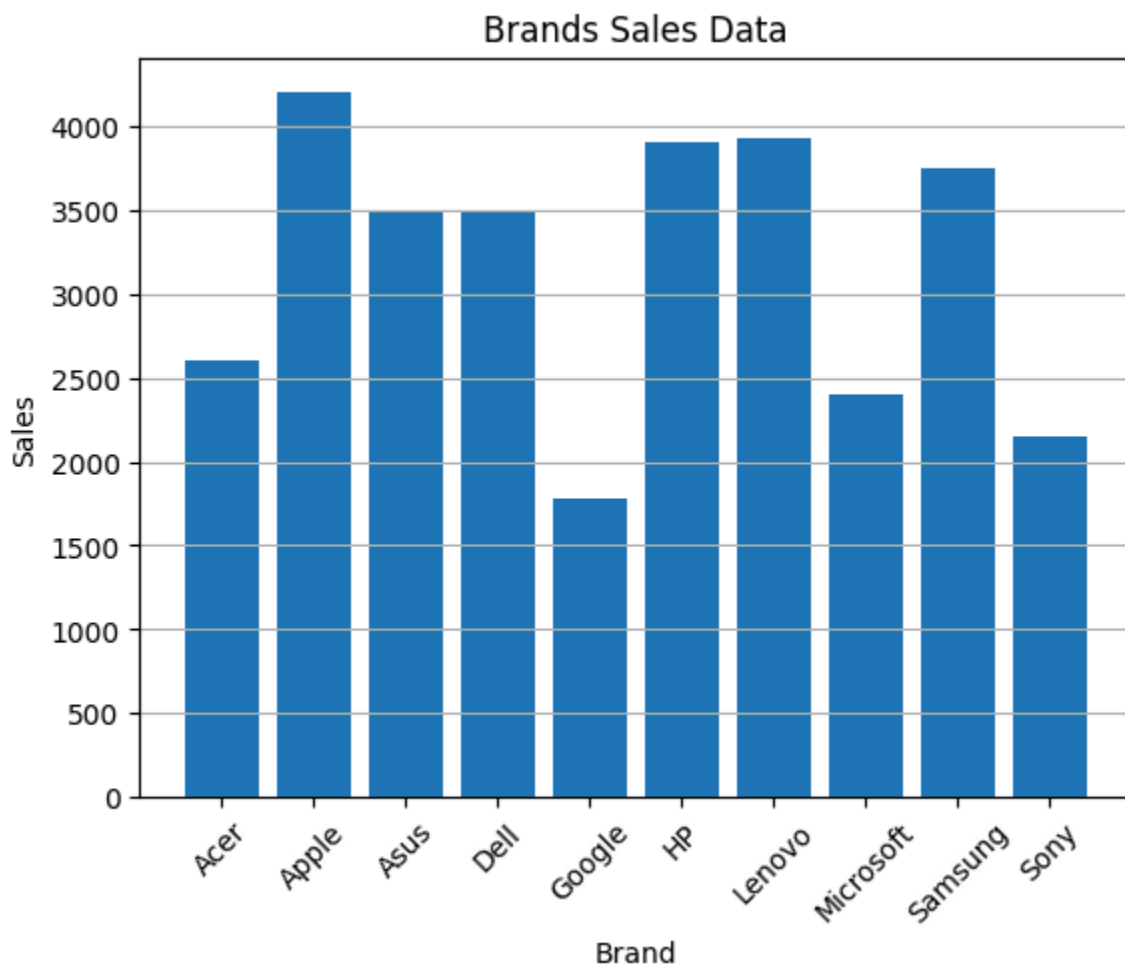


d. Read each brand's sales data and show it using the bar chart. Label them.

```

df["Date of Release"] = pd.to_datetime(df["Date of Release"])
brand_sales = df.groupby('Brand')['Price (USD)'].sum()
plt.bar(brand_sales.index, brand_sales.values)
plt.xlabel("Brand")
plt.ylabel("Sales")
plt.title("Brands Sales Data")
plt.xticks(rotation=45)
plt.grid(axis='y')
plt.show()

```



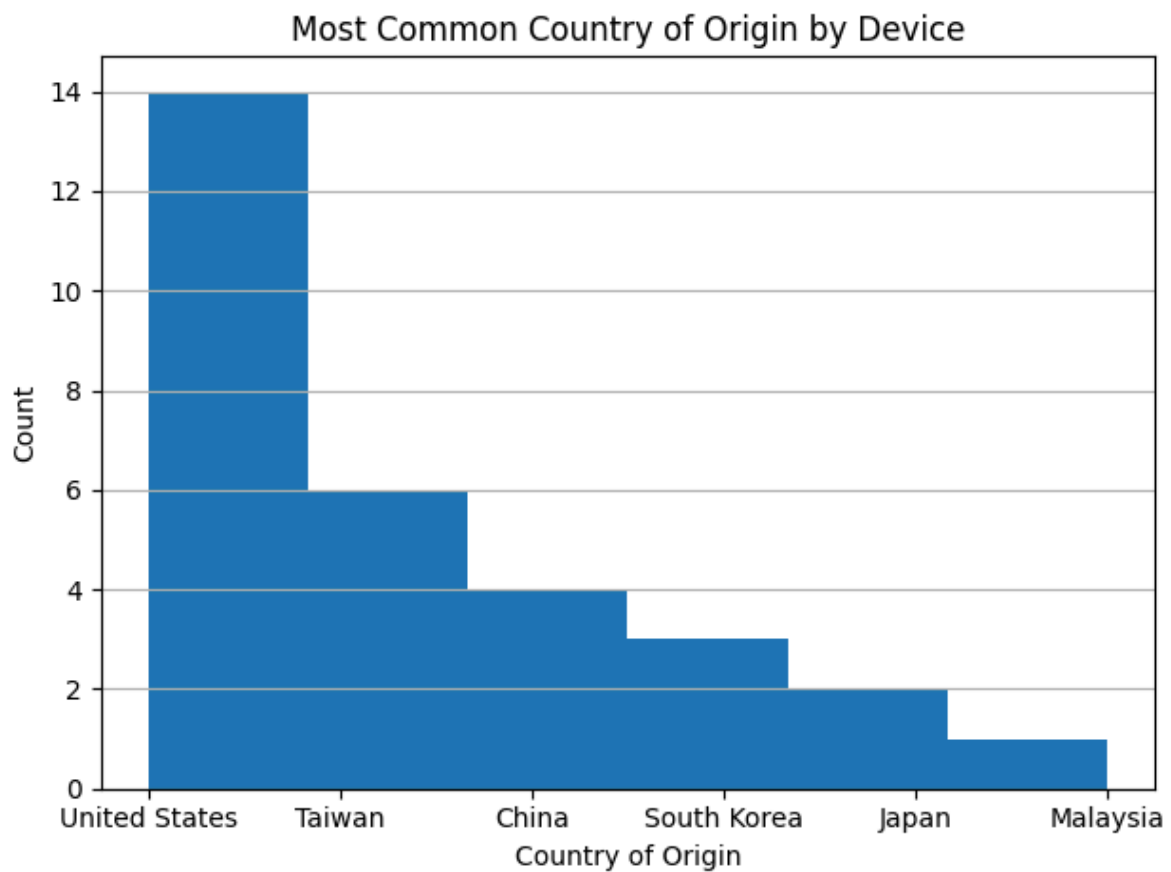
**e. Read each device and show it using the histogram to see the most common Country of Origin. Label them.**



```
import numpy as np

country = np.arange(len(country_counts))
plt.hist(country, weights=country_counts.values, bins=len(country_counts))
plt.xticks(country, country_counts.index)

plt.xlabel("Country of Origin")
plt.ylabel("Count")
plt.title("Most Common Country of Origin by Device")
plt.grid(axis='y')
plt.tight_layout()
plt.show()
```



**f. Create a pie chart that shows each brand Country of Origin. Label them.**

```

country_counts = df['Country of Origin'].value_counts()
plt.pie(country_counts, labels=country_counts.index, autopct='%1.1f%%')
plt.title("Distribution of Country of Origin")
brands = df['Brand']
plt.legend(brands, title='Brand', loc='upper left', bbox_to_anchor=(1, 1))
plt.show()

```

