

Tutorial Week 4: Matplotlib for Visualization (Solutions)

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Example: Read total sale units for all months and show it using a line plot

Total sale units data provided for each month, generated a line plot as shown at the end of this question (directly below the code cell).

Hint:

- The data are available in the files [company_sales_data.csv](#).
- Use `plt.plot()`.

```
[1]: import pandas as pd
import matplotlib.pyplot as plt

df = pd.read_csv("company_sales_data.csv")
df.head(5)
```

```
[1]:  month_number  facecream  facewash  toothpaste  bathingsoap  shampoo  \
0           1         2500        1500         5200         9200        1200
1           2         2630        1200         5100         6100        2100
2           3         2140        1340         4550         9550        3550
3           4         3400        1130         5870         8870        1870
4           5         3600        1740         4560         7760        1560

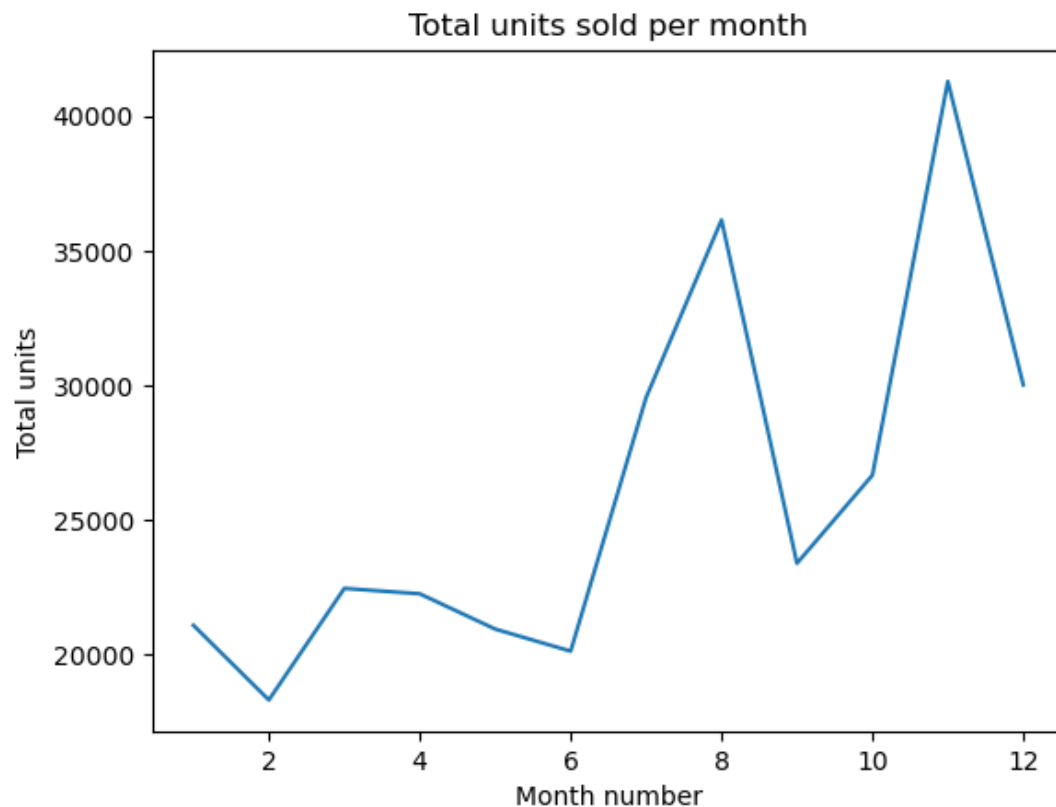
      moisturizer  total_units
0           1500         21100
1           1200         18330
2           1340         22470
3           1130         22270
4           1740         20960
```

```
[2]: ### Start your code here ###

plt.plot(df['month_number'], df['total_units'])
plt.xlabel('Month number')
plt.ylabel('Total units')
plt.title('Total units sold per month')

plt.show()

### End your code here ###
```



1 Questions

Hint:

- The data are available in the files [company_sales_data.csv](#).
- Write **your code** between two comment lines: `### Start/End your code here ###`.
- **Expected output** is shown at the end of each question (directly below the code cell).
- See the [Matplotlib gallery](#) that shows hundreds of charts made with Matplotlib.

1.1 Read all product sales data and show it using a multiline plot

Display the number of units sold per month for each product using multiline plots (i.e., separate line for each product).

Hint:

- Use `plt.plot()`.

```
[3]: import pandas as pd
import matplotlib.pyplot as plt

df = pd.read_csv("company_sales_data.csv")

### Start your code here ###
```

```

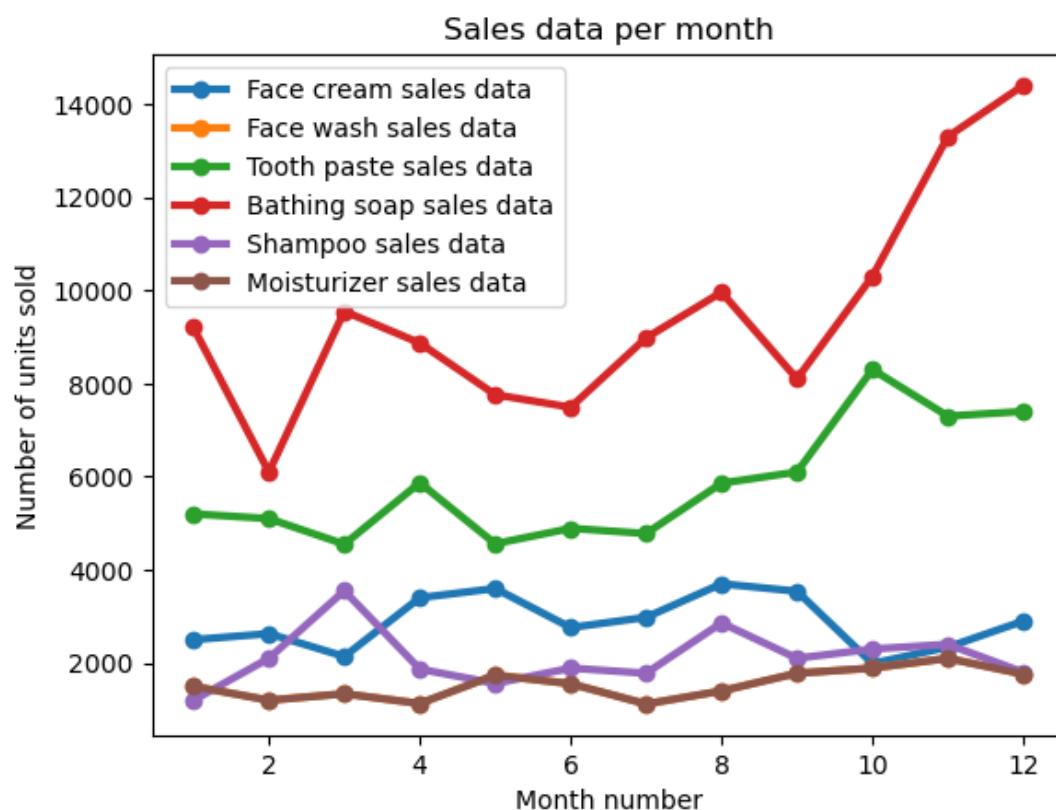
plt.plot(df['month_number'], df['facecream'], label = 'Face cream sales_
→data', marker='o', linewidth=3)
plt.plot(df['month_number'], df['facewash'], label = 'Face wash sales data',
→marker='o', linewidth=3)
plt.plot(df['month_number'], df['toothpaste'], label = 'Tooth paste sales_
→data', marker='o', linewidth=3)
plt.plot(df['month_number'], df['bathingsoap'], label = 'Bathing soap sales_
→data', marker='o', linewidth=3)
plt.plot(df['month_number'], df['shampoo'], label = 'Shampoo sales data',
→marker='o', linewidth=3)
plt.plot(df['month_number'], df['moisturizer'], label = 'Moisturizer sales_
→data', marker='o', linewidth=3)

plt.xlabel('Month number')
plt.ylabel('Number of units sold')
plt.legend(loc='upper left')
plt.title('Sales data per month')

plt.show()

### End your code here ###

```



1.2 Read toothpaste sales data of each month and show it using a scatter plot

Hint:

- Use `plt.scatter()`.

```
[4]: import pandas as pd
import matplotlib.pyplot as plt

df = pd.read_csv("company_sales_data.csv")

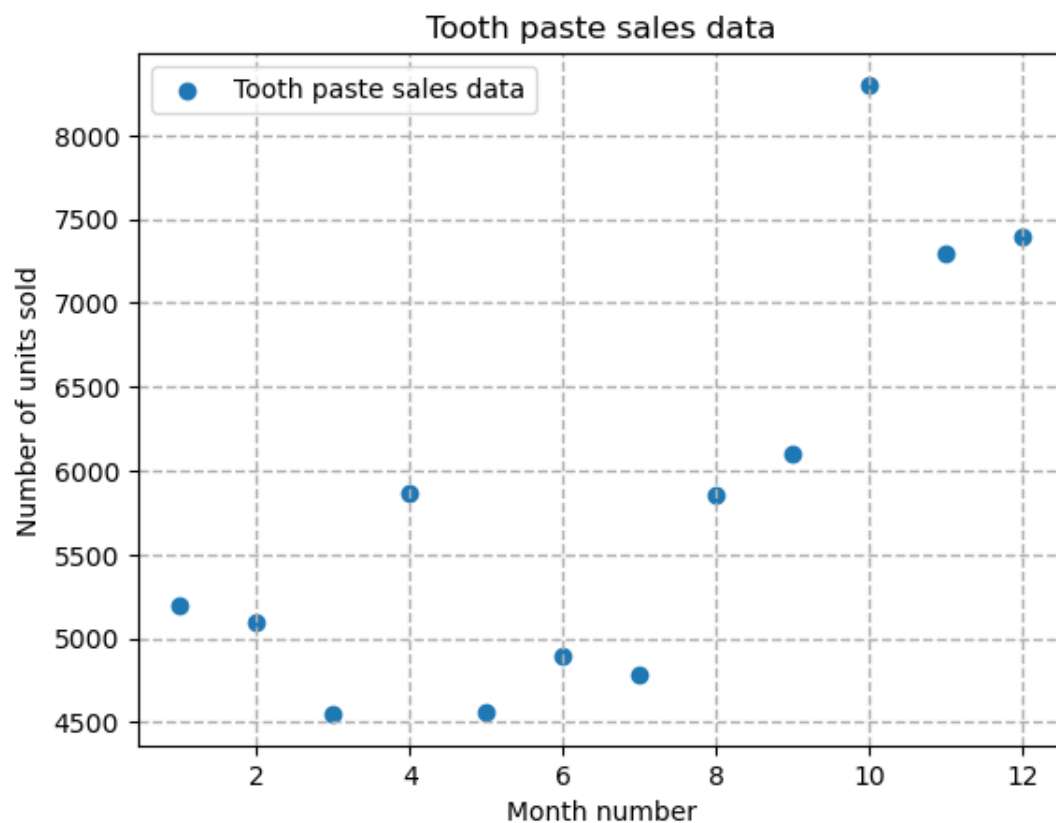
### Start your code here ###

plt.scatter(df['month_number'], df['toothpaste'], label = 'Tooth paste sales_
→data')

plt.xlabel('Month number')
plt.ylabel('Number of units sold')
plt.legend(loc='upper left')
plt.title('Tooth paste sales data')
plt.grid(True, linewidth= 1, linestyle="--")

plt.show()

### End your code here ###
```



1.3 Read face cream and face wash product sales data and show it using the bar chart

Hint:

- Use `plt.bar()`.

```
[5]: import pandas as pd
import matplotlib.pyplot as plt

df = pd.read_csv("company_sales_data.csv")

### Start your code here ###

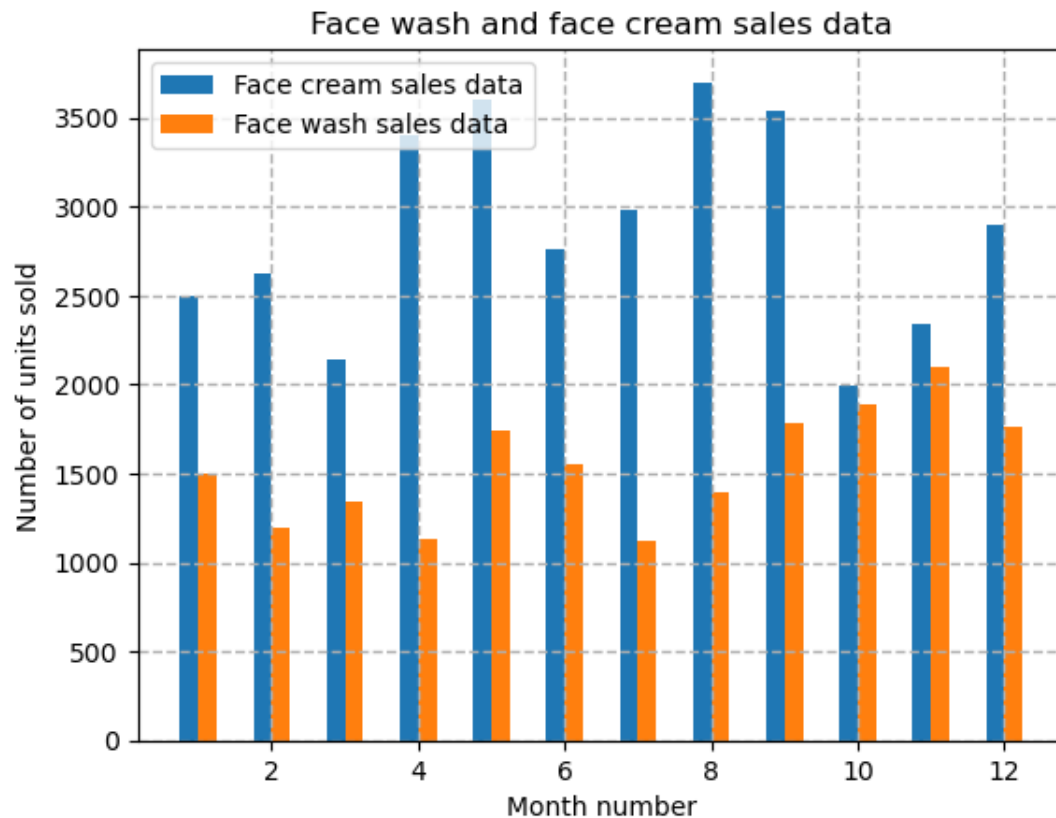
monthList = df['month_number'].tolist()

plt.bar([a-0.25 for a in monthList], df['facecream'], width= 0.25, label = 'Face cream sales data', align='edge')
plt.bar([a+0.25 for a in monthList], df['facewash'], width= -0.25, label = 'Face wash sales data', align='edge')

plt.xlabel('Month number')
plt.ylabel('Number of units sold')
plt.legend(loc='upper left')
plt.title('Face wash and face cream sales data')
plt.grid(True, linewidth= 1, linestyle="--")

plt.show()

### End your code here ###
```



1.4 Calculate total sale data for the whole year for each product and show it using a Pie chart

The Pie chart displays number of units sold per year for each product in percentage.

Hint:

- Use `plt.pie()`.

```
[6]: import pandas as pd
import matplotlib.pyplot as plt

df = pd.read_csv("company_sales_data.csv")

### Start your code here ###

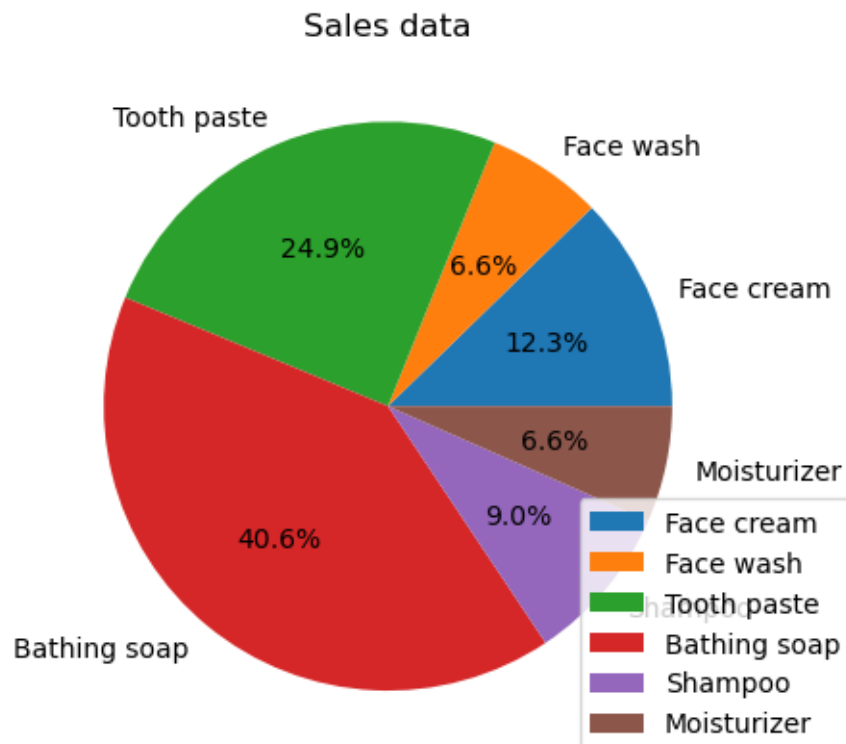
labels = ['Face cream', 'Face wash', 'Tooth paste', 'Bathing soap', 'Shampoo', 'Moisturizer']
salesData = [df['facecream'].sum(), df['facewash'].sum(), df['toothpaste'].sum(),
              df['bathingsoap'].sum(), df['shampoo'].sum(), df['moisturizer'].sum()]

plt.axis("equal")
plt.pie(salesData, labels=labels, autopct='%1.1f%%')
```

```
plt.legend(loc='lower right')
plt.title('Sales data')

plt.show()

### End your code here ###
```



1.5 Read the data of bathing soap and face wash and display them in separate subplots

Hint:

- Use `plt.subplots()`.

```
[7]: import pandas as pd
import matplotlib.pyplot as plt

df = pd.read_csv("company_sales_data.csv")

### Start your code here ###

f, ax = plt.subplots(2, sharex=True)
ax[0].plot(df['month_number'], df['bathingsoap'], label = 'Bathingsoap sales_
↳data', color='k', marker='o', linewidth=3)
ax[0].set_ylabel('Sold units of bathing soap')
```

```
ax[1].plot(df['month_number'], df['facewash'], label = 'Face wash sales_
→data', color='r', marker='o', linewidth=3)
ax[1].set_ylabel('Sold units of face wash')

plt.xlabel('Month number')

plt.show()

### End your code here ###
```

