Week2

July 31, 2025

[80]:
```
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
```

1 Follow along with these steps:

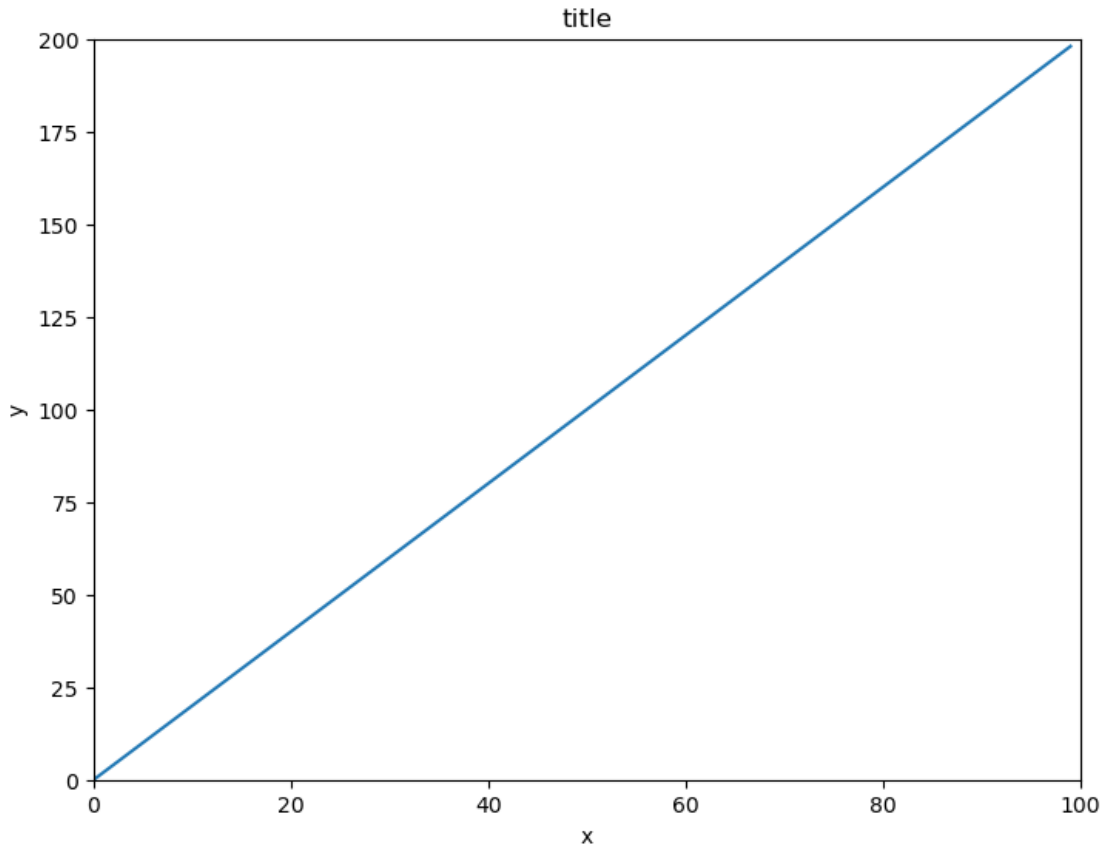
a) Create a figure object called fig using plt.figure()

b) Use add_axes to add an axis to the figure canvas at [0,0,1,1]. Call this new axis ax.

c) Plot (x,y) on that axes and set the labels and titles to match the plot:

[81]:
```
%matplotlib inline

fig = plt.figure()

ax = fig.add_axes([0, 0, 1, 1])

x = np.arange(0, 100)
y = 2*x

ax.plot(x, y)


ax.set_xlabel('x')
ax.set_ylabel('y')
ax.set_title('title')
ax.set_xlim(0, 100)
ax.set_ylim(0, 200)
```

[81]:
```
(0.0, 200.0)
```

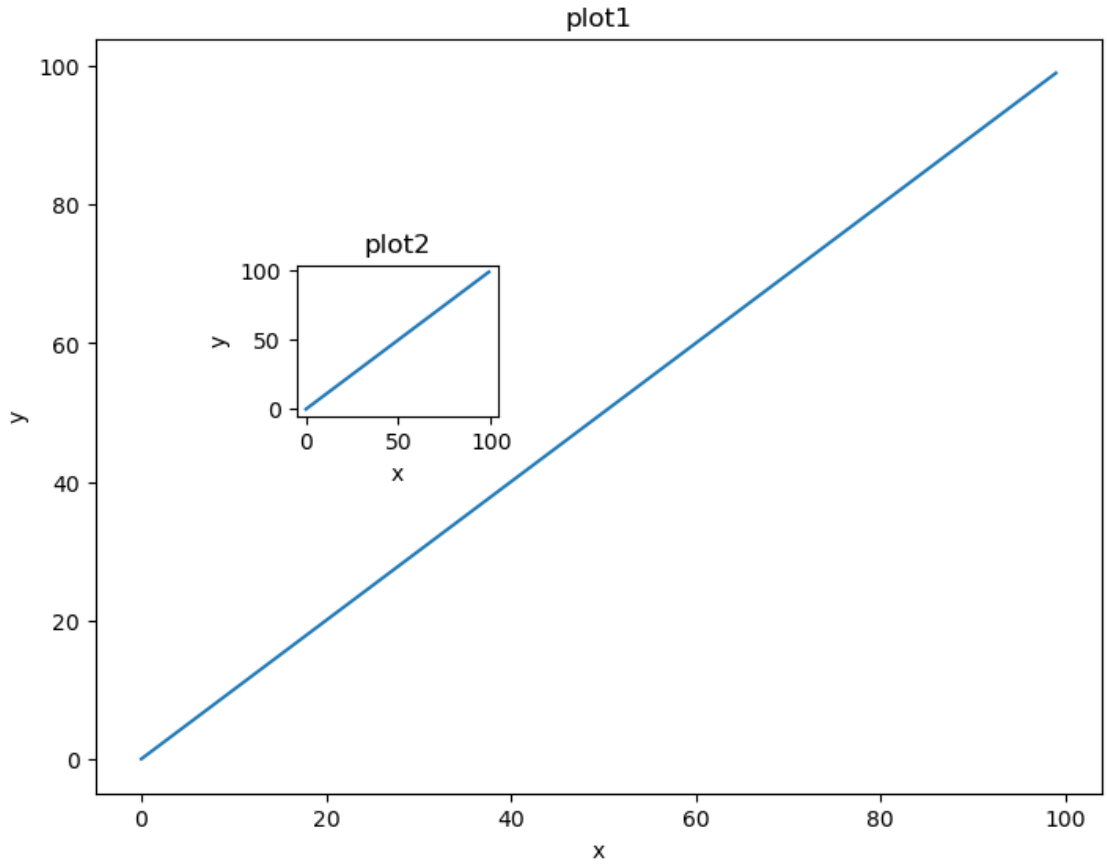


2 Create a figure object and put two axes on it, ax1 and ax2. Located at [0,0,1,1] and [0.2,0.5,.2,.2] respectively. Now plot (x,y) on both axes. And call your figure object to show it.

[53]:
```
%matplotlib inline

fig = plt.figure()

ax1 = fig.add_axes([0, 0, 1, 1])
ax2 = fig.add_axes([0.2, 0.5, 0.2, 0.2])

x = np.arange(0, 100)
y = x

ax1.plot(x, y)
ax2.plot(x,y)
```

```
ax1.set_xlabel('x')
ax1.set_ylabel('y')
ax1.set_title('plot1')

ax2.set_xlabel('x')
ax2.set_ylabel('y')
ax2.set_title('plot2')
```

[53]: `Text(0.5, 1.0, 'plot2')`



[63]:
```
df=pd.read_csv("../company_sales_data.csv")
display(df)
```

	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	
5	6	2760	1555	4890	7490	1890	

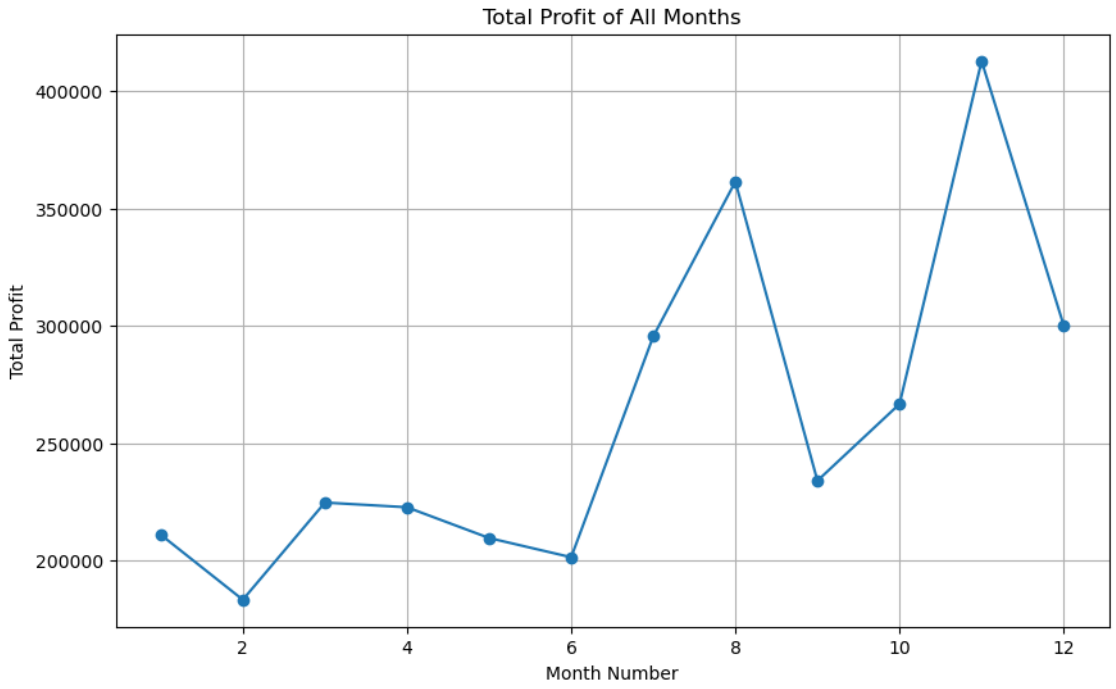
6	7	2980	1120	4780	8980	1780
7	8	3700	1400	5860	9960	2860
8	9	3540	1780	6100	8100	2100
9	10	1990	1890	8300	10300	2300
10	11	2340	2100	7300	13300	2400
11	12	2900	1760	7400	14400	1800

	moisturizer	total_units	total_profit
0	1500	21100	211000
1	1200	18330	183300
2	1340	22470	224700
3	1130	22270	222700
4	1740	20960	209600
5	1555	20140	201400
6	1120	29550	295500
7	1400	36140	361400
8	1780	23400	234000
9	1890	26670	266700
10	2100	41280	412800
11	1760	30020	300200

3 Use the company sales dataset csv file, read Total profit of all months and show it using a line plotTotal profit data provided for each month. Generated line plot must include the following properties: –

a. X label name = Month Number
b. Y label name = Total profit

[68]:
```
plt.figure(figsize=(10, 6))
plt.plot(df['month_number'], df['total_profit'], marker='o')

plt.xlabel('Month Number')
plt.ylabel('Total Profit')
plt.title('Total Profit of All Months')

plt.grid(True)
plt.show()
```



4 Use the company sales dataset csv file, get total profit of all months and show line plot with the following Style properties. Generated line plot must include following Style properties: –

a. Line Style dotted and Line-color should be red

b. Show legend at the lower right location.

c. X label name = Month Number

d. Y label name = Sold units number

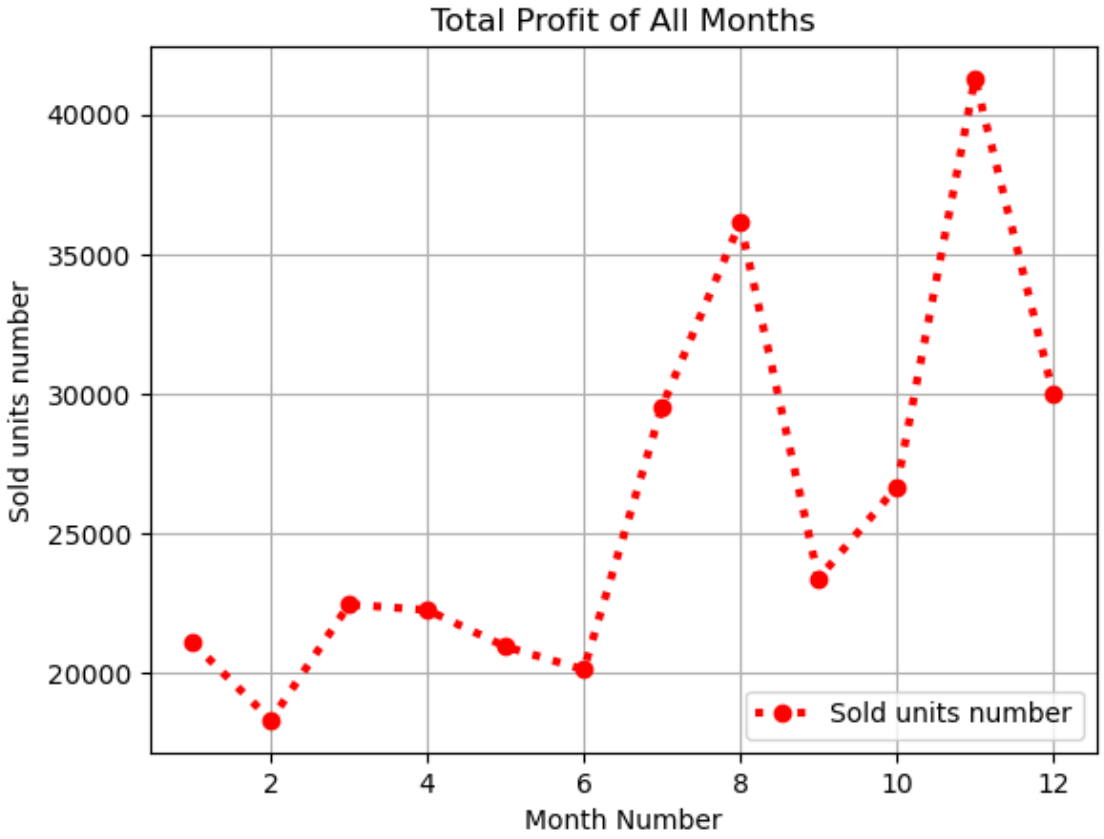
e. Add a circle marker.

f. Line marker color as read

g. Line width should be 3

[83]:
```
plt.plot(df['month_number'], df['total_units'], linestyle=':',␣
↪color='red',marker='o'
        ,linewidth = '3')

plt.xlabel('Month Number')
```

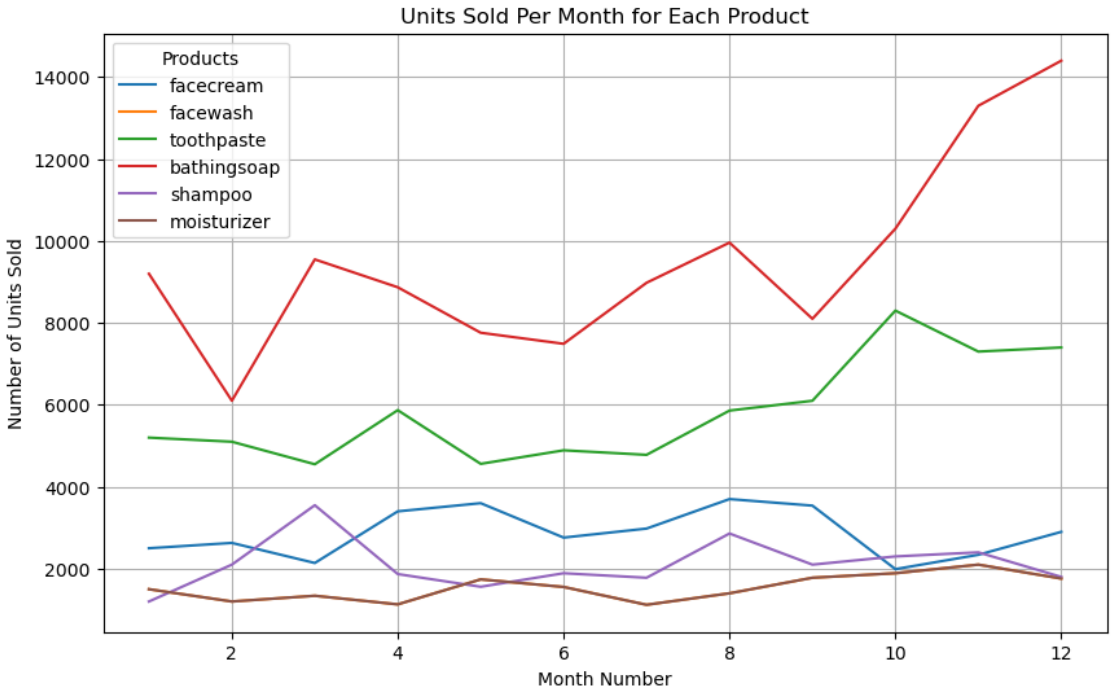
```
plt.ylabel('Sold units number')
plt.title('Total Profit of All Months')
plt.legend(["Sold units number"], loc="lower right")

plt.grid(True)
plt.show()
```



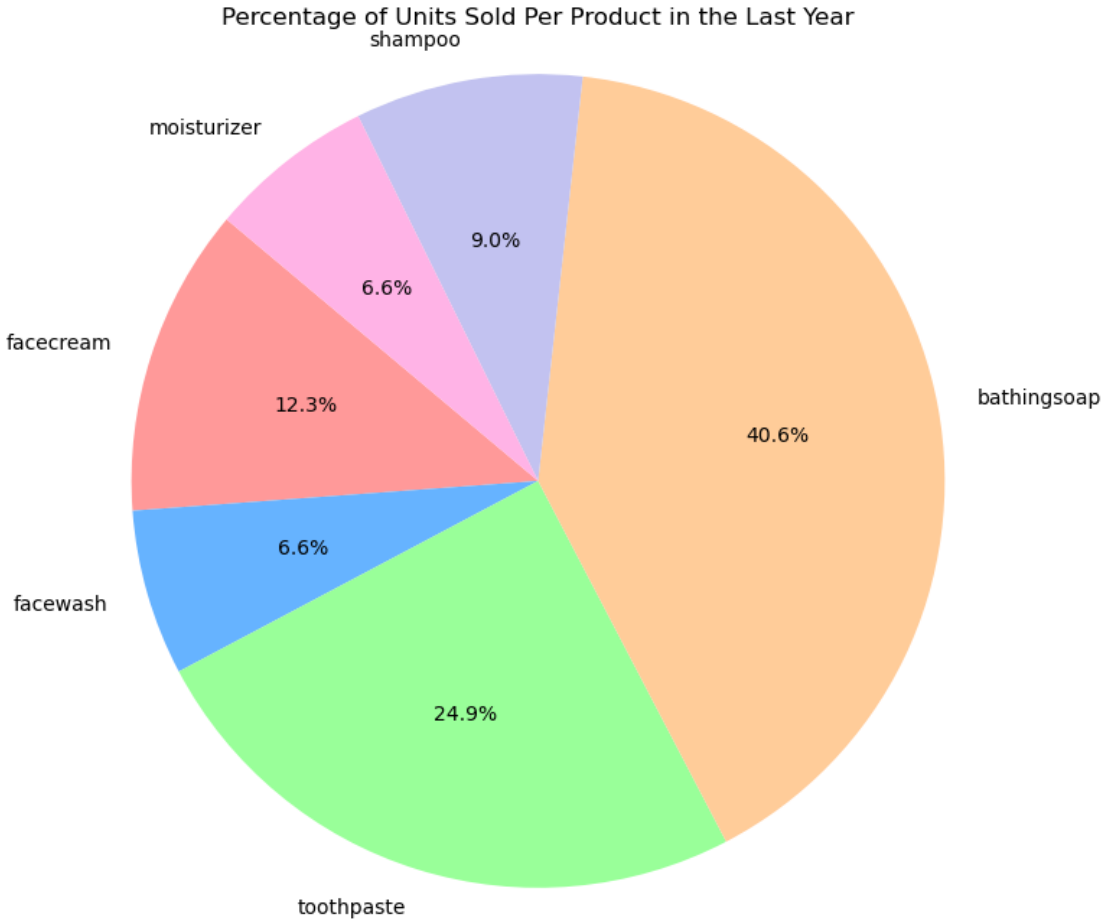
5 Use the company sales dataset csv file, read all product sales data and show it using a multiline plot. Display the number of units sold per month or each product using multiline plots. (i.e., Separate Plotline for each product).

[84]:
```
plt.figure(figsize=(10, 6))

products = ['facecream', 'facewash', 'toothpaste', 'bathingsoap', 'shampoo',␣
 ↪'moisturizer']

for product in products:
```

```
    plt.plot(df['month_number'], df[product], label=product)

plt.xlabel('Month Number')
plt.ylabel('Number of Units Sold')
plt.title('Units Sold Per Month for Each Product')
plt.legend(title="Products", loc='upper left')

plt.grid(True)
plt.show()
```



[86]:
```
total_units_per_product = df[['facecream', 'facewash', 'toothpaste',␣
 ↪'bathingsoap', 'shampoo', 'moisturizer']].sum()

plt.figure(figsize=(8, 8))
plt.pie(total_units_per_product, labels=total_units_per_product.index,␣
 ↪autopct='%1.1f%%', startangle=140,␣
 ↪colors=['#ff9999','#66b3ff','#99ff99','#ffcc99','#c2c2f0','#ffb3e6'])

plt.title('Percentage of Units Sold Per Product in the Last Year')
plt.axis('equal')

plt.show()
```


Percentage of Units Sold Per Product in the Last Year
shampoo
moisturizer
facecream
facewash
toothpaste
bathingsoap
9.0%
6.6%
12.3%
6.6%
24.9%
40.6%