In [ ]:
```python
#ROLL NO: 22150
#NAME: Neha Kamalakar Nemade
#SUBJECT: Data analytics
#Data Visualization in Python
```
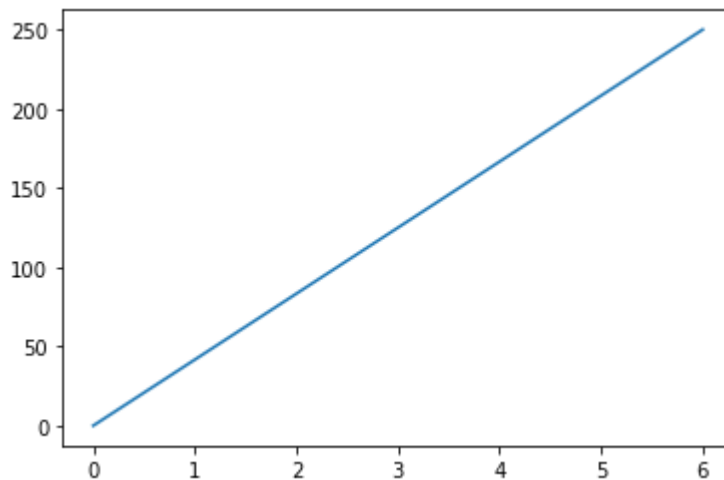
In [ ]:
```python
#1.Matplotlib, Pandas, Seaborn: Sactterplot, Barchart, Linechart,Histogram.
#2.Other Graphs: Boxplot, Heatmap, Faceting, Pairplot,
```

In [1]:
```python
#Simple graph
import matplotlib.pyplot as plt
import numpy as np
xpoints=np.array([0,6])
ypoints=np.array([0,250])
plt.plot(xpoints,ypoints)
plt.show()
```
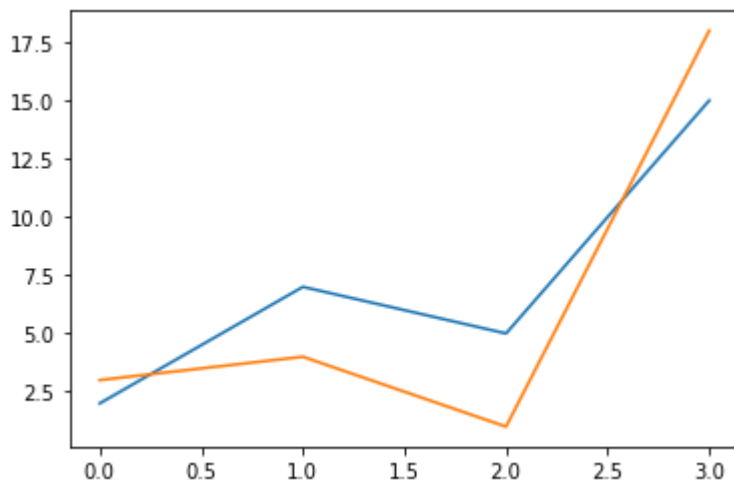

In [2]:
```python
import matplotlib.pyplot as plt
import numpy as np
ypoints=np.array([2,7,5,15,1])
plt.plot(ypoints,marker='o')
plt.show()
```
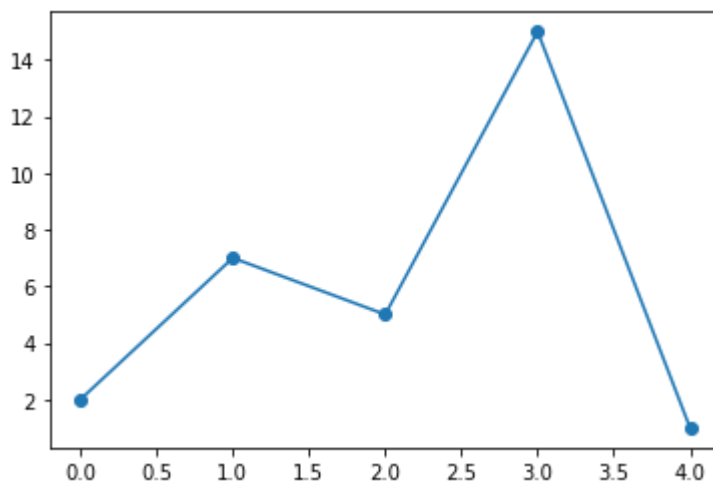
In [3]:
```python
#changing colour and style
import matplotlib.pyplot as plt
import numpy as np
ypoints=np.array([2,7,5,15,1])
plt.plot(ypoints,'o:r')
plt.show()
```
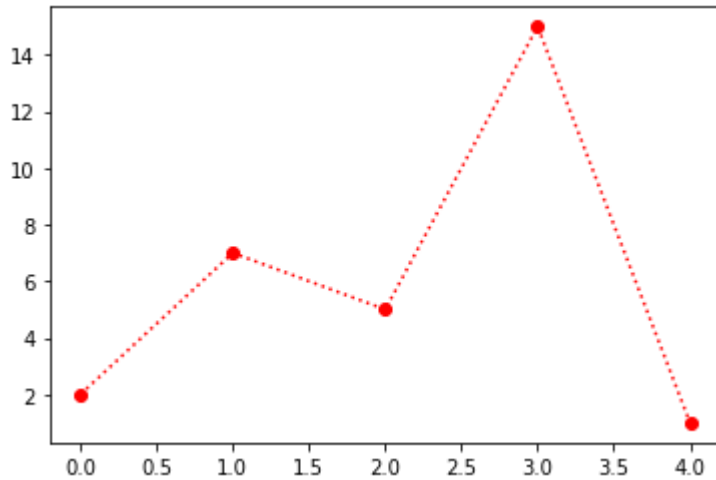

In [4]:
```python
import matplotlib.pyplot as plt
import numpy as np
y1=np.array([2,7,5,15])
y2=np.array([3,4,1,18])
plt.plot(y1)
plt.plot(y2)
plt.show()
```

In [5]:
```python
import matplotlib.pyplot as plt
import numpy as np
ypoints=np.array([2,7,5,15,1])
plt.plot(ypoints,linewidth='15.5')
plt.show()
```
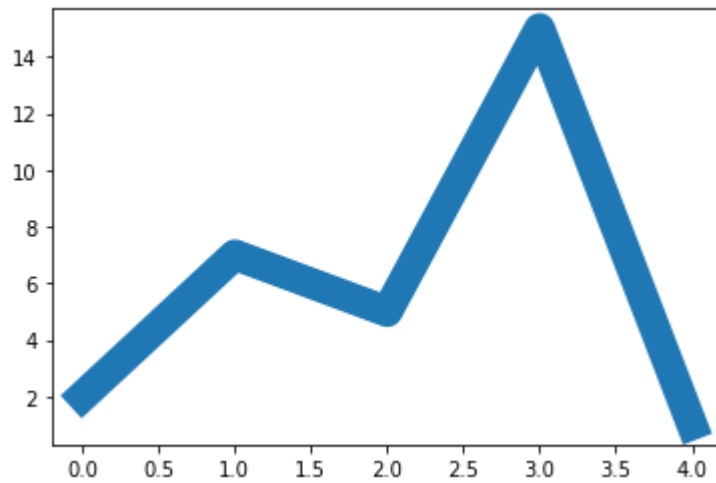
In [6]:
```python
import matplotlib.pyplot as plt
import numpy as np
#plot 1
x=np.array([2,3,5,10])
y=np.array([3,4,8,18])
plt.subplot(2,1,1)
plt.plot(x,y)
#plot 2
x=np.array([1,5,8,9])
y=np.array([2,3,10,8])
plt.subplot(2,1,2)
plt.plot(x,y)
plt.show()
```
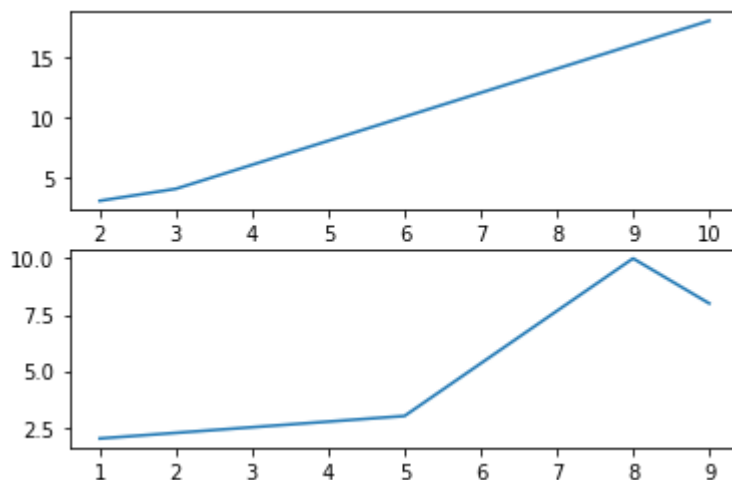

In [7]:
```python
import matplotlib.pyplot as plt
import numpy as np

x=np.array([2,3,5,10,11,14,19,20,25,30])
y=np.array([3,4,8,18,30,59,100,112,150,123])
colors= np.array(["red","green","yellow","blue","cyan","black","pink","orange","r
plt.scatter(x,y,c=colors)
plt.show()
```
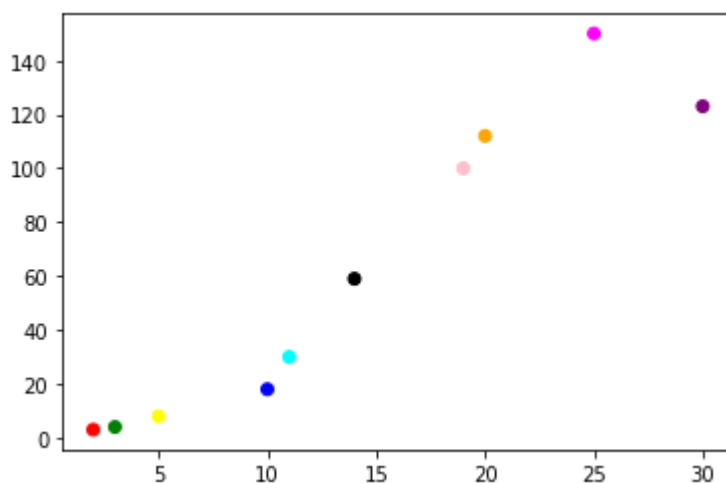
In [8]:
```python
#Scatter Plot
x = [1,1.5,2,2.5,3,3.5,3.6]
y = [7.5,8,8.5,9,9.5,10,10.5]
x1=[8,8.5,9,9.5,10,10.5,11]
y1=[3,3.5,3.7,4,4.5,5,5.2]
plt.scatter(x,y, label='high income low saving',color='r')
plt.scatter(x1,y1,label='low income high savings',color='b')
plt.xlabel('saving*100')
plt.ylabel('income*1000')
plt.title('Scatter Plot')
plt.legend()
plt.show()
```
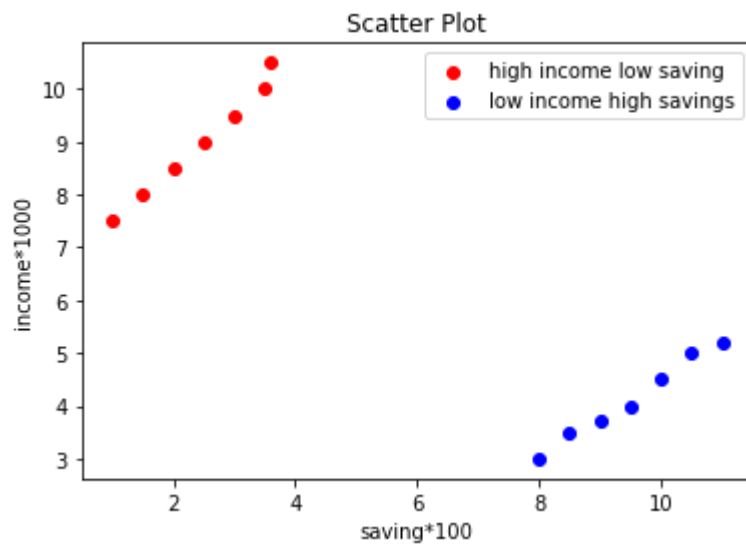
In [13]:
```python
#Area Plots
days = [1,2,3,4,5]
sleeping =[7,8,6,11,7]
eating = [2,3,4,3,2]
working =[7,8,7,2,2]
playing = [8,5,7,8,13]
plt.plot([],[],color='m', label='Sleeping', linewidth=5)
plt.plot([],[],color='b', label='Eating', linewidth=5)
plt.plot([],[],color='y', label='Working', linewidth=5)
plt.plot([],[],color='k', label='Playing', linewidth=5)
plt.stackplot(days, sleeping,eating,working,playing, colors=['m','b','y','k'])
plt.xlabel('x')
plt.ylabel('y')
plt.title('Stack Plot')
plt.legend()
plt.show()
```
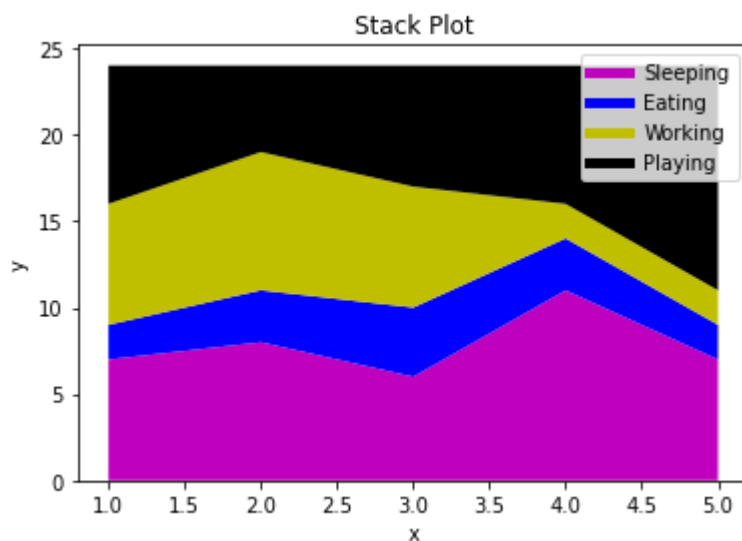
In [14]:
```python
#pie chart
import matplotlib.pyplot as plt
import numpy as np

x=np.array([45,15,25,25])
mylabels=["data science","iot","communication","robotics"]
plt.pie(x,labels=mylabels)
plt.show()
```
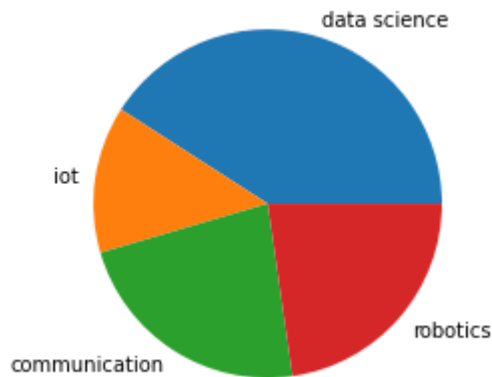

In [17]:
```python
#Pie Chart
days = [1,2,3,4,5]
sleeping =[7,8,6,11,7]
eating = [2,3,4,3,2]
working =[7,8,7,2,2]
playing = [8,5,7,8,13]
slices = [7,2,2,13]
activities = ['sleeping','eating','working','playing']
cols = ['g','m','r','b']
plt.pie(slices,labels=activities,colors=cols,startangle=90,shadow= True,
 explode=(0,0.1,0,0),autopct='%1.1f%%')
plt.title('Pie Plot')
plt.show()
```

In [18]:
```python
#Box Plot
# Creating dataset
np.random.seed(10)
data = np.random.normal(100, 20, 200)
fig = plt.figure(figsize =(10, 7))
# Creating plot
plt.boxplot(data)
# show plot
plt.show()
```
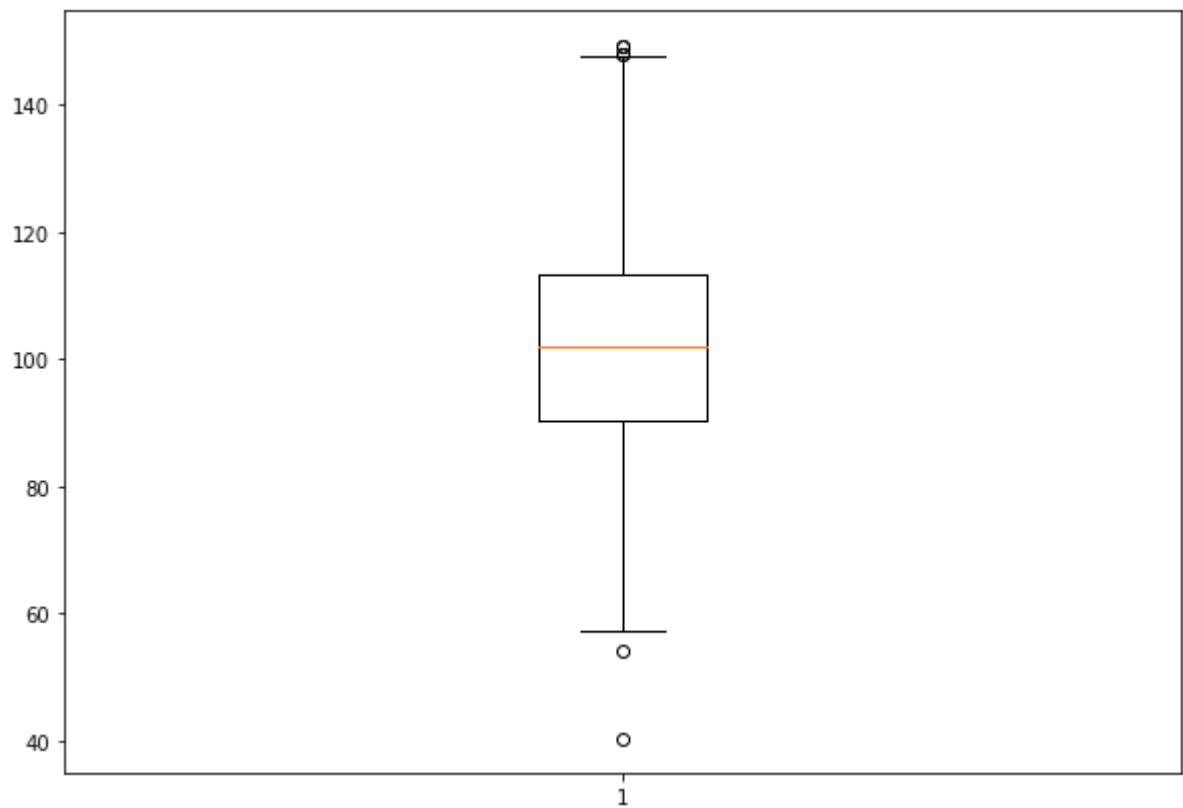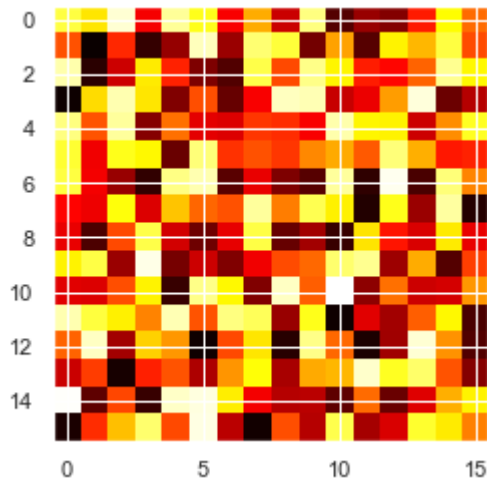
In [22]:
```python
#heatmap
import numpy as np
np.random.seed(0)
import seaborn as sns; sns.set_theme()
uniform_data = np.random.rand(10, 12)
ax = sns.heatmap(uniform_data)
```
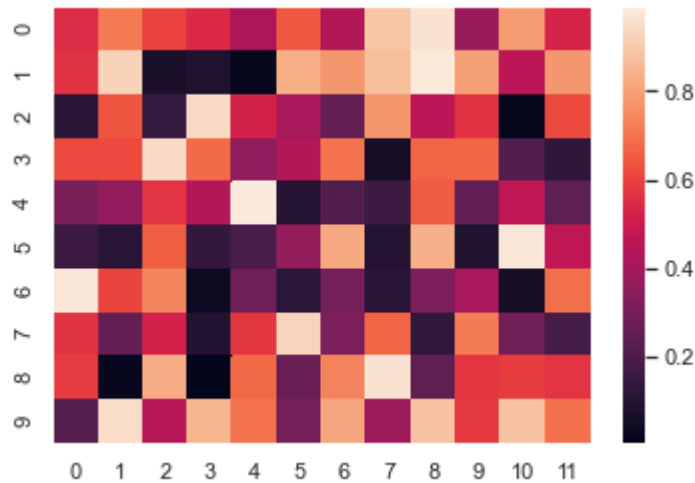

In [35]:
```python
#heatmap using matplotlib
import matplotlib.pyplot as plt
import numpy as np

a = np.random.random((16, 16))
plt.imshow(a, cmap='hot', interpolation='nearest')
plt.show()
```


In [28]:
```python
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
import seaborn as sns
import os
```
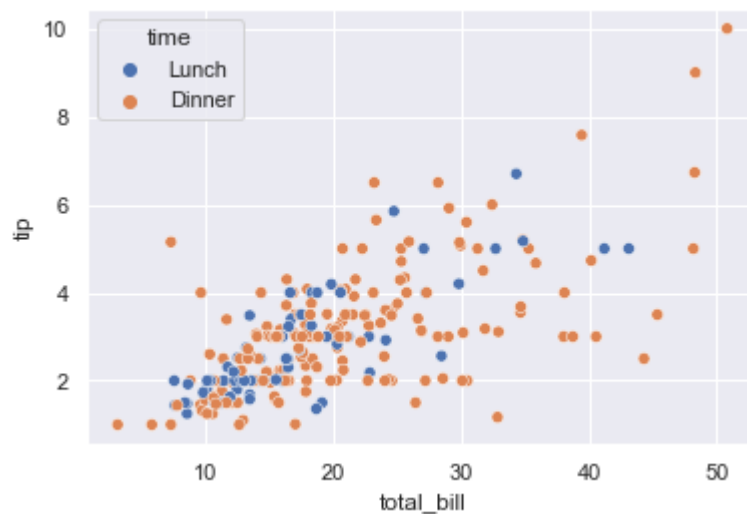
In [23]:
```python
tips = sns.load_dataset("tips")
tips.head()
```

Out[23]:

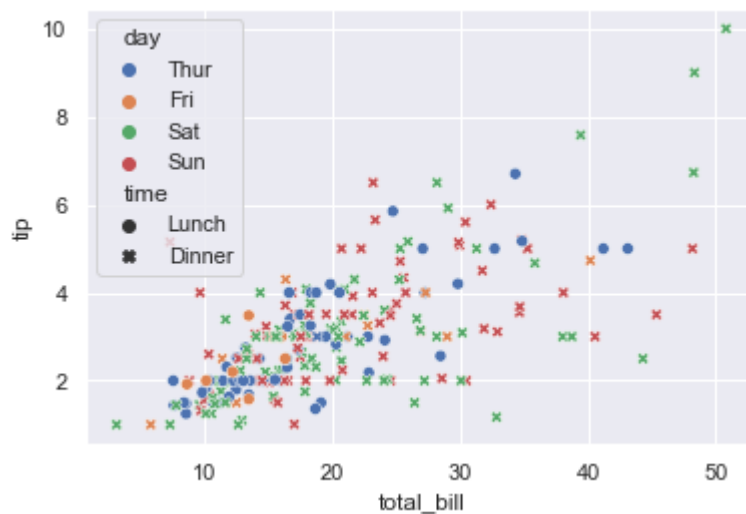|	total_bill	tip	sex	smoker	day	time	size
0	16.99	1.01	Female	No	Sun	Dinner	2
1	10.34	1.66	Male	No	Sun	Dinner	3
2	21.01	3.50	Male	No	Sun	Dinner	3
3	23.68	3.31	Male	No	Sun	Dinner	2
4	24.59	3.61	Female	No	Sun	Dinner	4

In [24]:
```python
sns.scatterplot(data=tips, x="total_bill", y="tip", hue="time")
```

Out[24]: <AxesSubplot:xlabel='total_bill', ylabel='tip'>

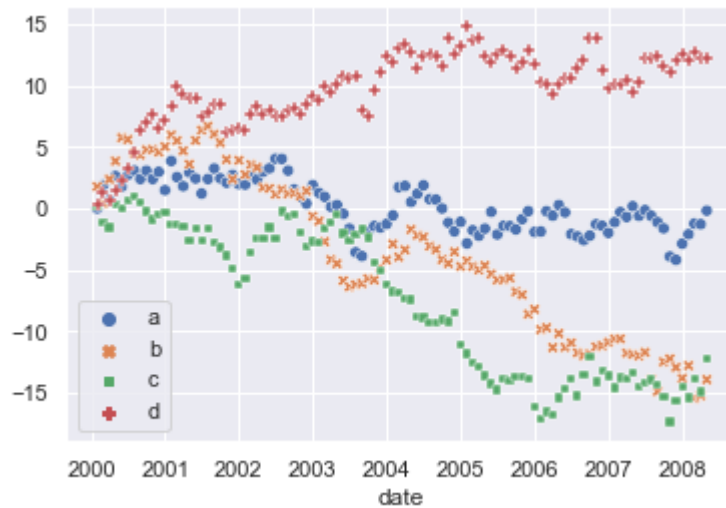In [25]: `sns.scatterplot(data=tips, x="total_bill", y="tip", hue="day", style="time")`

Out[25]: `<AxesSubplot:xlabel='total_bill', ylabel='tip'>`

In [26]: `sns.scatterplot(data=tips, x="total_bill", y="tip", hue="size")`

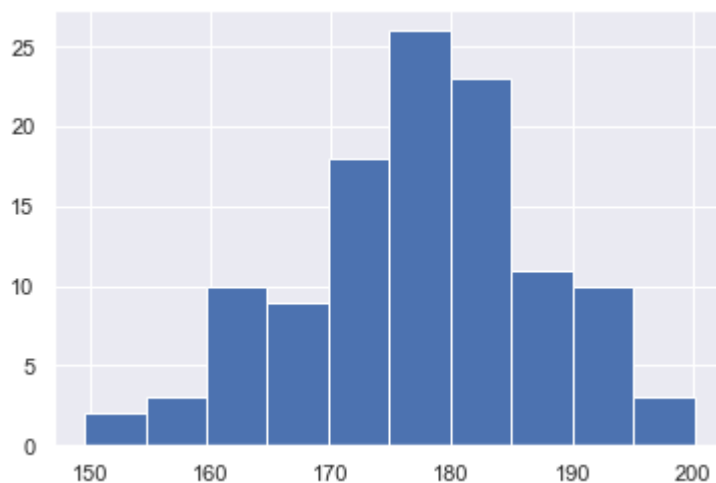Out[26]: `<AxesSubplot:xlabel='total_bill', ylabel='tip'>`

In [29]:
```python
index = pd.date_range("1 1 2000", periods=100, freq="m", name="date")
data = np.random.randn(100, 4).cumsum(axis=0)
wide_df = pd.DataFrame(data, index, ["a", "b", "c", "d"])
sns.scatterplot(data=wide_df)
```

Out[29]: <AxesSubplot:xlabel='date'>

In [30]:
```python
#Histogram using matplotlib
import matplotlib.pyplot as plt
import numpy as np

x=np.random.normal(180,10,115)
plt.hist(x)
plt.show()
```

In [31]:
```python
#barplot
import matplotlib.pyplot as plt
import numpy as np

x1=np.array([1,3,5,7])
y1 = np.array([3, 8, 1, 10])

x2=np.array([2,4,6,8])
y2= np.array([5, 6, 8, 1])

plt.bar(x1,y1,color='g')
plt.bar(x2,y2,color='r')

plt.show()
```
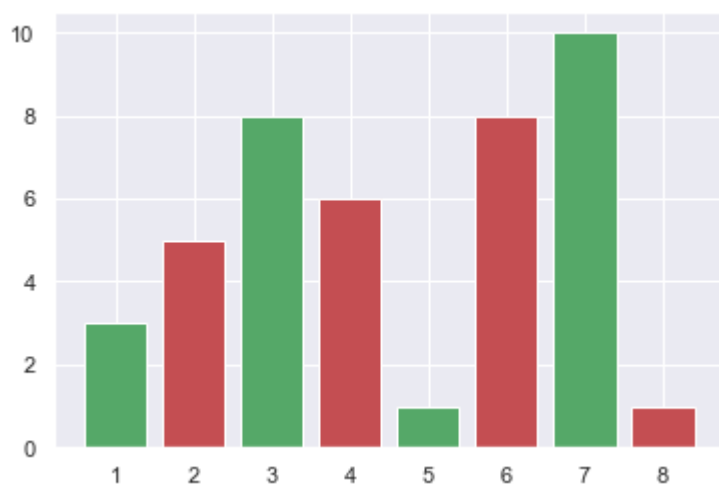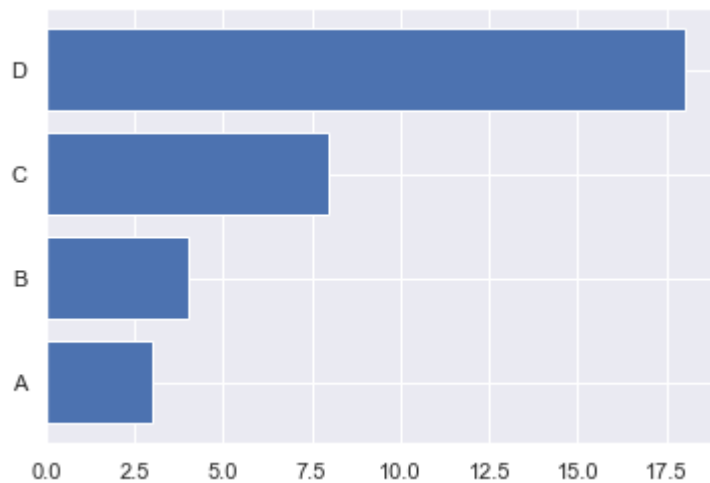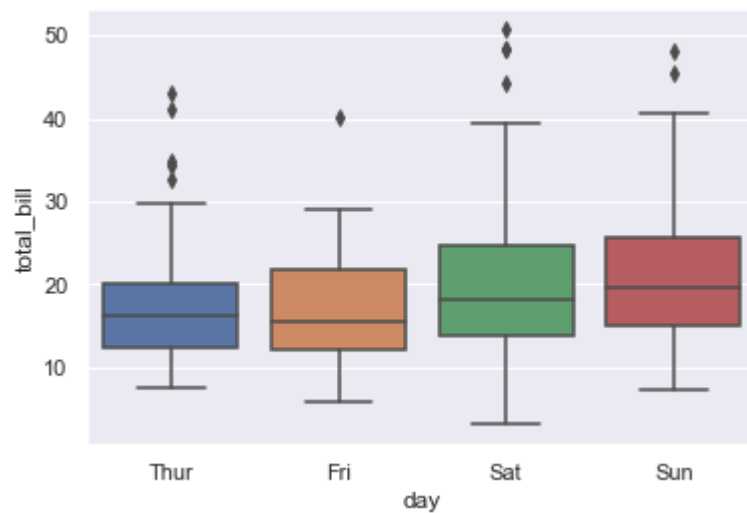
In [32]:
```python
import matplotlib.pyplot as plt
import numpy as np

x=np.array(["A","B","C","D"])
y=np.array([3,4,8,18])

plt.barh(x,y)
plt.show()
```


In [33]:
```python
ax = sns.boxplot(x="day", y="total_bill", data=tips)
```
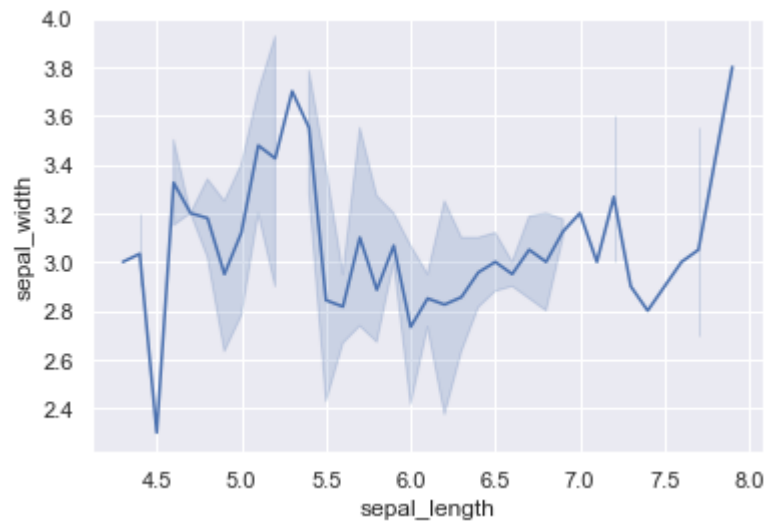
In [34]:
```python
#linechart using seaborn
import seaborn as sns
import matplotlib.pyplot as plt

# loading dataset
data = sns.load_dataset("iris")

# draw lineplot
sns.lineplot(x="sepal_length", y="sepal_width", data=data)
plt.show()
```
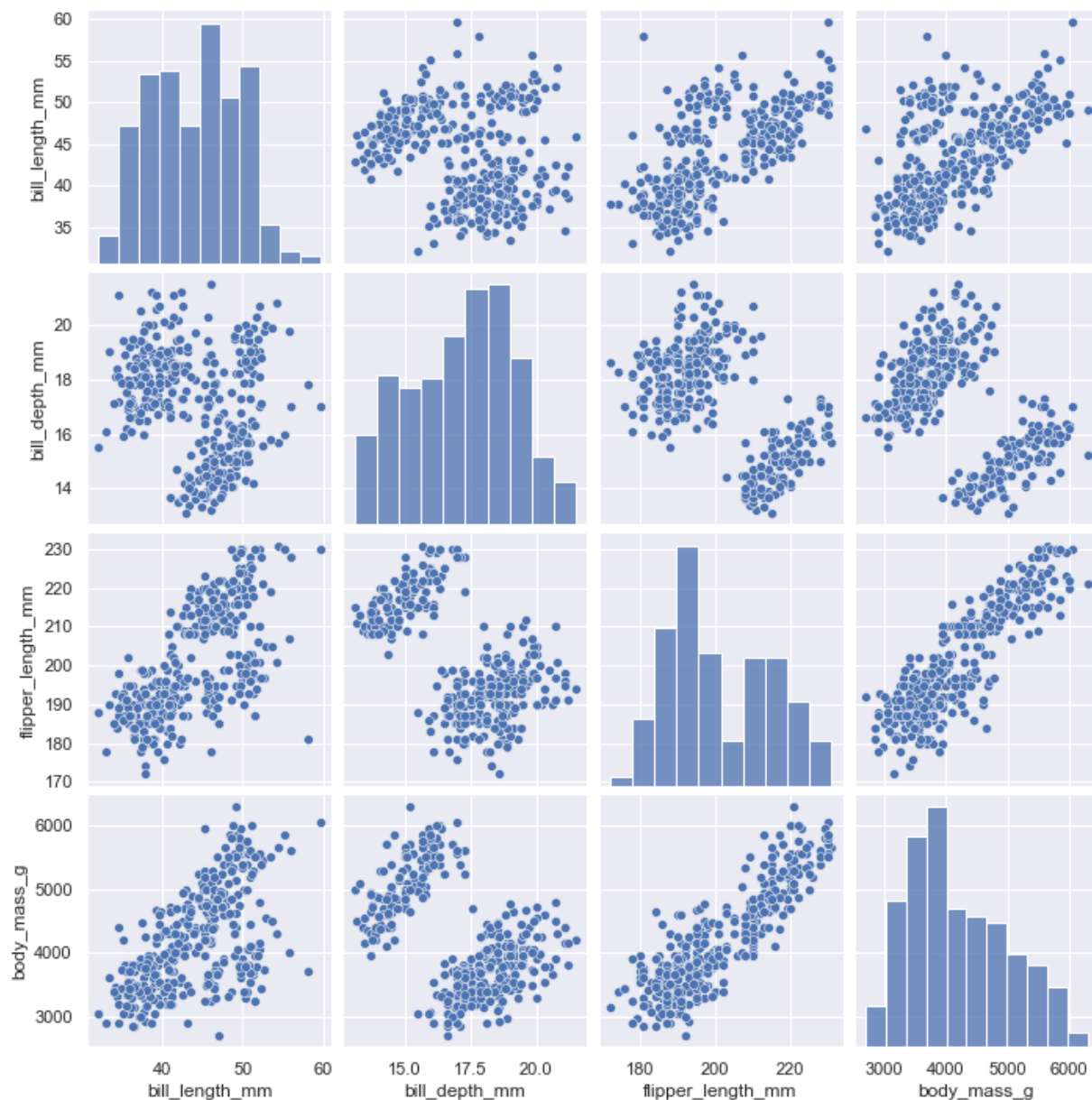
In [36]:
```python
#pairplot using seaborn
penguins = sns.load_dataset("penguins")
sns.pairplot(penguins)
```

Out[36]: <seaborn.axisgrid.PairGrid at 0x23482a30100>

In [37]: `#faceting`
`tips = sns.load_dataset("tips")`
`sns.FacetGrid(tips)`

Out[37]: `<seaborn.axisgrid.FacetGrid at 0x23482d3fca0>`