**Name: Ayush Fating**

**Roll no.: 642**

**PRN: 202201070127**
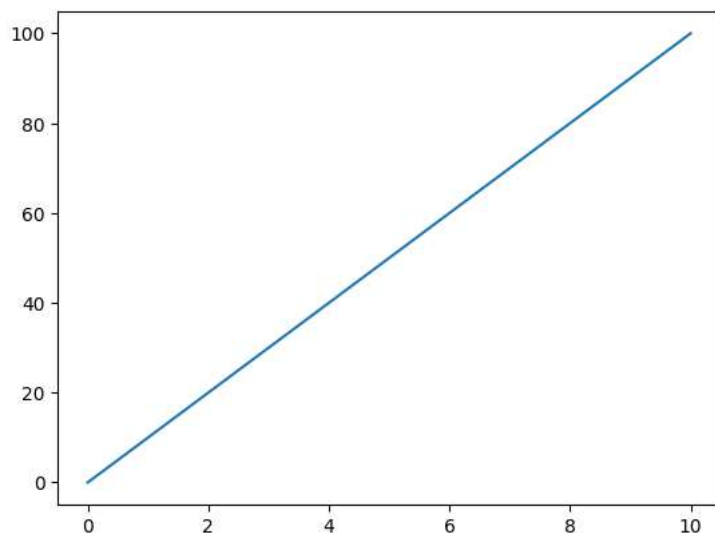
**Division: F2**

# ▾ Matplotlib

```
import matplotlib.pyplot as plt
import numpy as np
import pandas as pd

x=np.array([0,10])
y=np.array([0,100])

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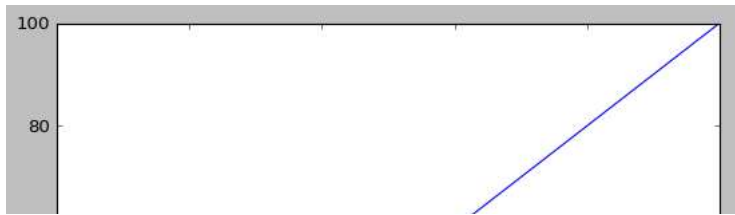


```
plt.style.use('classic')
```
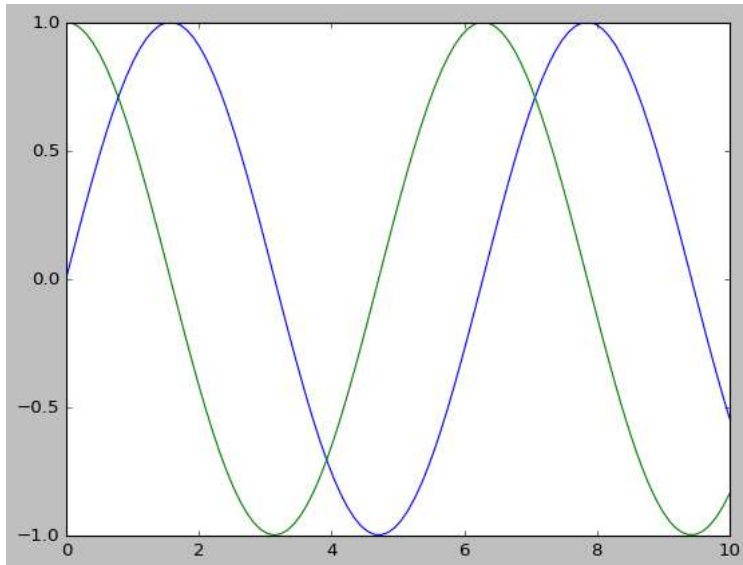
```
import matplotlib.pyplot as plt
import numpy as np

x=np.array([0,10])
y=np.array([0,100])

plt.plot(x,y)
plt.show()
```
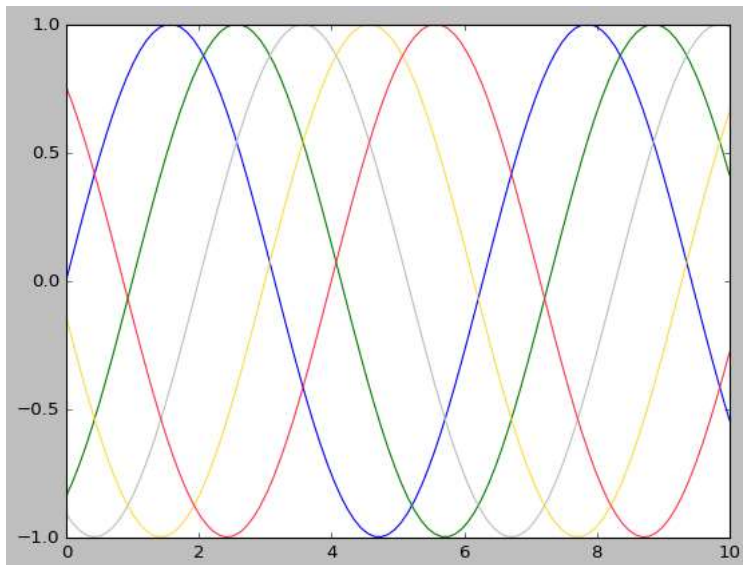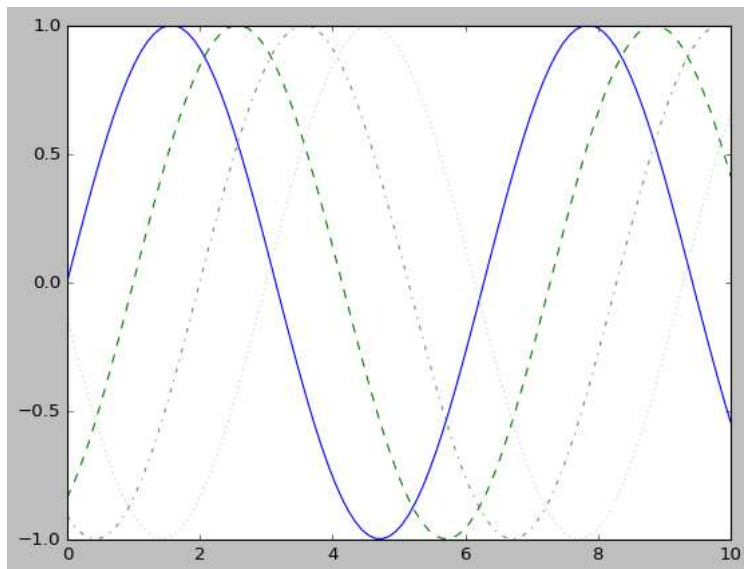
```
x=np.linspace(0,10,100)
fig=plt.figure()
plt.plot(x,np.sin(x))
plt.plot(x,np.cos(x))
fig.savefig('graph1.png')
```



```
fig=plt.figure()
plt.plot(x,np.sin(x-0),color='blue')
plt.plot(x,np.sin(x-1),color='g')
plt.plot(x,np.sin(x-2),color='0.75')
plt.plot(x,np.sin(x-3),color='#FFDD44')
plt.plot(x,np.sin(x-4),color=(1.0,0.2,0.3))
fig.savefig('graph2.png')
```

```
fig=plt.figure()
plt.plot(x,np.sin(x-0),color='blue',linestyle='solid')
plt.plot(x,np.sin(x-1),color='g',linestyle='dashed')
plt.plot(x,np.sin(x-2),color='0.50',linestyle='dashdot')
plt.plot(x,np.sin(x-3),color='#AADDCC',linestyle='dotted')
fig.savefig('graph3.png')
```



```
fig=plt.figure()
plt.plot(x,np.sin(x-0),color='blue',linestyle='-')
plt.plot(x,np.sin(x-1),color='g',linestyle='--')
plt.plot(x,np.sin(x-2),color='0.50',linestyle='-.')
plt.plot(x,np.sin(x-3),color='#AADDCC',linestyle=':')
fig.savefig('graph4.png')
```
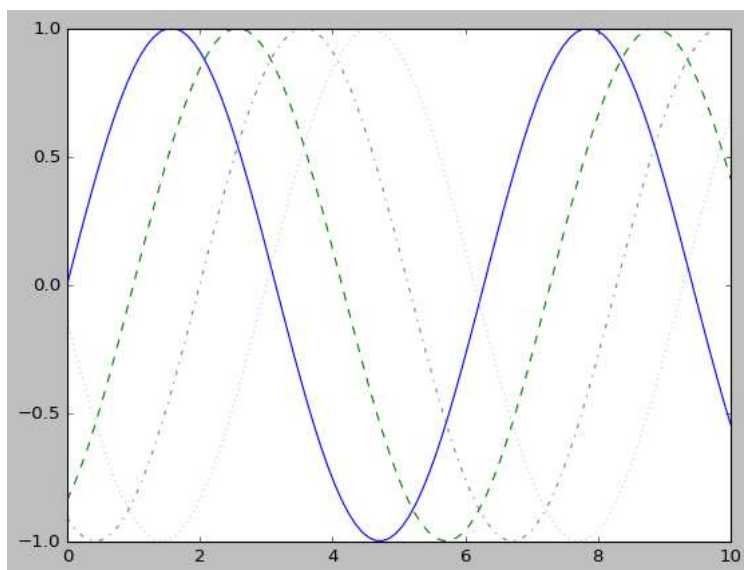


```
fig=plt.figure()
x=[1,2,3,4,5]
y=[10,15,7,12,9]
plt.plot(x,y,marker='*')
plt.title("Line Chart Example")
plt.xlabel("Time")
plt.ylabel("Dependent Variable")
plt.show()
fig.savefig('graph5.png')
```
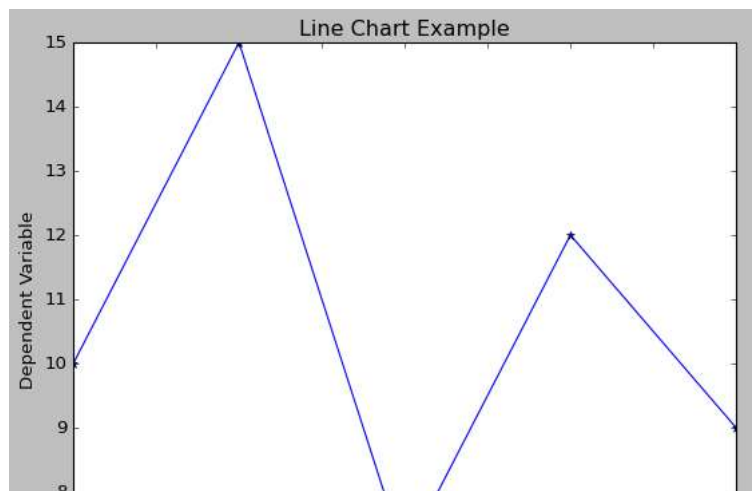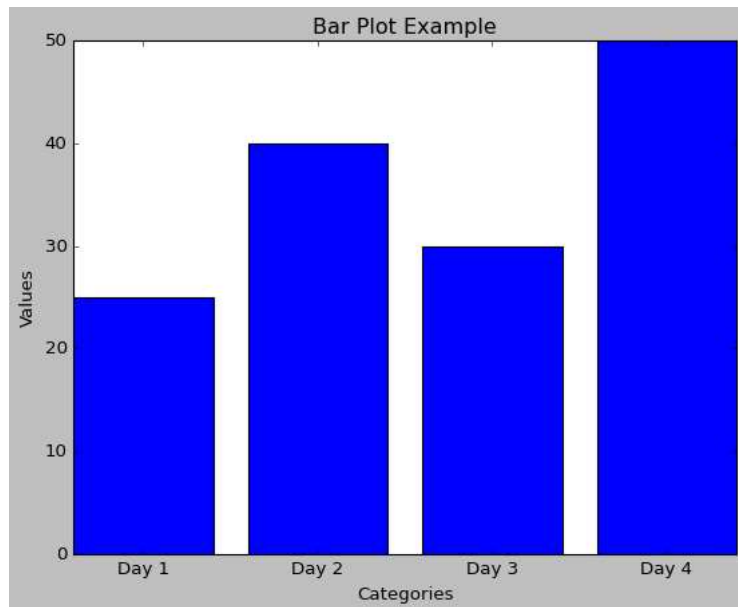
```
fig=plt.figure()
categories=['Day 1','Day 2','Day 3','Day 4']
values=[25,40,30,50]
plt.bar(categories,values)
plt.title("Bar Plot Example")
plt.xlabel("Categories")
plt.ylabel("Values")
plt.show()
fig.savefig('graph6.png')
```



```
fig=plt.figure()
categories=['Day 1','Day 2','Day 3','Day 4']
values=[25,40,30,50]
plt.barh(categories,values)
plt.title("Bar Plot Example")
plt.xlabel("Categories")
plt.ylabel("Values")
plt.show()
fig.savefig('graph7.png')
```
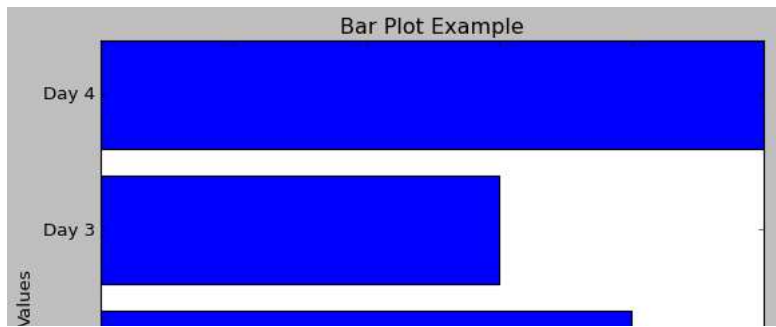
```
fig=plt.figure()
x=np.random.normal(170,10,250)
print(x)
plt.hist(x)
plt.show()
fig.savefig('graph8.png')
```

```
[166.04100567 152.01713214 167.38678633 189.90029095 154.92497295
 164.23014663 179.42745111 174.13388347 154.11267598 167.63884831
 152.77743911 169.69604433 188.51060876 188.76194687 173.79191888
 175.80516851 165.25964558 178.05069187 164.8304751  162.64799015
 161.96216205 161.79278476 149.51555948 160.76277582 176.00879668
 168.7009731  153.21629628 177.11635616 170.20695004 185.09646257
 169.68699143 163.5648219  161.98021468 173.15758879 172.5239758
 175.13321838 176.7882906  178.52557176 157.8887707  170.94537316
 163.82736354 158.79810406 170.32932799 181.10919319 174.68048457
 170.82041459 155.15023072 170.528486   166.90501385 161.61236476
 184.66065162 156.71581636 182.06582623 184.90639348 157.3253258
 161.80464791 168.62850046 176.12558051 170.96893553 179.52983648
 162.56424554 180.91235816 154.4244174  182.73929288 144.43709685
```

```python
df=pd.DataFrame([['A',10,20,10,30],['B',20,25,15,25],['C',12,15,19,6],['D',10,29,13,19]],
                columns=['Team','Round 1','Round 2','Round 3','Round4'])
print(df)

df.plot(x='Team',
kind='bar',stacked=False,title='Grouped Bar Graph with dataframe')
```
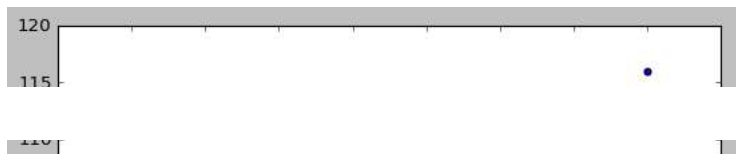
```
  Team  Round 1  Round 2  Round 3  Round4
0    A       10       20       10      30
1    B       20       25       15      25
2    C       12       15       19       6
3    D       10       29       13      19
<Axes: title={'center': 'Grouped Bar Graph with dataframe'}, xlabel='Team'>
```
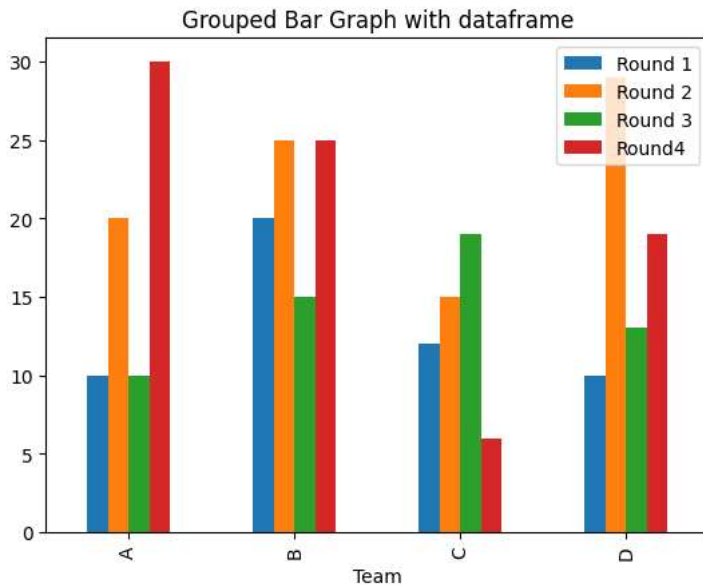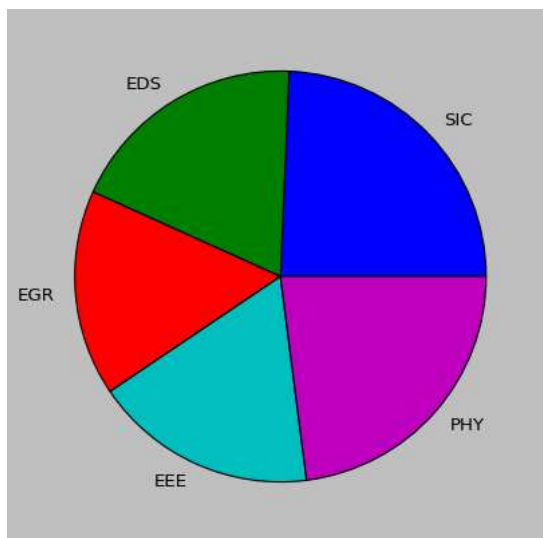


```python
fig=plt.figure()
x=np.array([5,7,8,7,2,17,2,9,4,11,12,9,16])
y=np.array([99,86,87,88,111,86,103,87,94,78,77,85,116])
plt.scatter(x,y)
plt.show()
fig.savefig('graph9.png')
```

```
fig=plt.figure()
y=np.array([18,14,12,13,17])
mylabels=["SIC","EDS","EGR","EEE","PHY"]
plt.pie(y, labels = mylabels)
plt.show()
fig.savefig('graph_11.png')
```



```
fig=plt.figure()
x=np.array([0,1,2,3,4])
y=np.array([3,8,1,10,6])
plt.subplot(2,1,1)
plt.plot(x,y)
plt.show()
fig.savefig('graph_12.png')
```
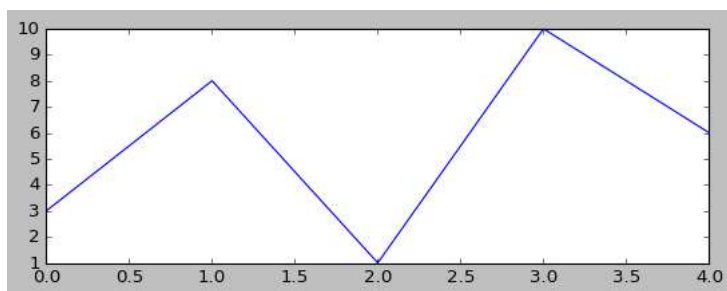
**Name: Ayush Fating**

**Roll no: 642**

**PRN: 202201070127**

**Division: F2**

```python
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
from pandas import Series, DataFrame
```

```python
df1=pd.read_csv('/content/tips (1).csv')
df1.head()
```

|   | 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 |

```python
df1.tail()
```

|   | total_bill | tip | sex | smoker | day | time | size |
|---|---|---|---|---|---|---|---|
| 239 | 29.03 | 5.92 | Male | No | Sat | Dinner | 3 |
| 240 | 27.18 | 2.00 | Female | Yes | Sat | Dinner | 2 |
| 241 | 22.67 | 2.00 | Male | Yes | Sat | Dinner | 2 |
| 242 | 17.82 | 1.75 | Male | No | Sat | Dinner | 2 |
| 243 | 18.78 | 3.00 | Female | No | Thur | Dinner | 2 |

```python
df1.columns
```

```
Index(['total_bill', 'tip', 'sex', 'smoker', 'day', 'time', 'size'], dtype='object')
```

```python
df1.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 244 entries, 0 to 243
Data columns (total 7 columns):
 #   Column      Non-Null Count  Dtype
---  ------      --------------  -----
 0   total_bill  244 non-null    float64
 1   tip         244 non-null    float64
 2   sex         244 non-null    object
 3   smoker      244 non-null    object
 4   day         244 non-null    object
 5   time        244 non-null    object
 6   size        244 non-null    int64
dtypes: float64(2), int64(1), object(4)
memory usage: 13.5+ KB
```
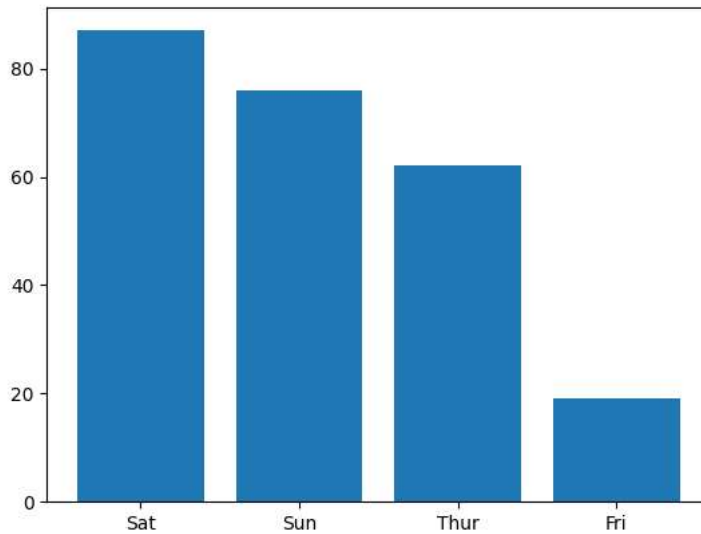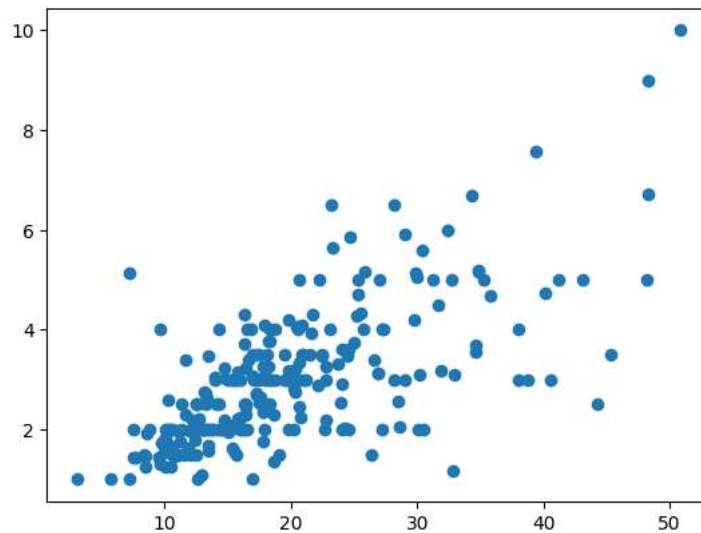
```python
df1.describe()
```

|       | total_bill | tip        | size       |
|-------|------------|------------|------------|
| count | 244.000000 | 244.000000 | 244.000000 |
| mean  | 19.785943  | 2.998279   | 2.569672   |
| std   | 8.902412   | 1.383638   | 0.951100   |
| min   | 3.070000   | 1.000000   | 1.000000   |

```
a=pd.DataFrame(df1['day'].value_counts())
a.reset_index(inplace=True)
plt.bar(a['index'],a['day'])
```
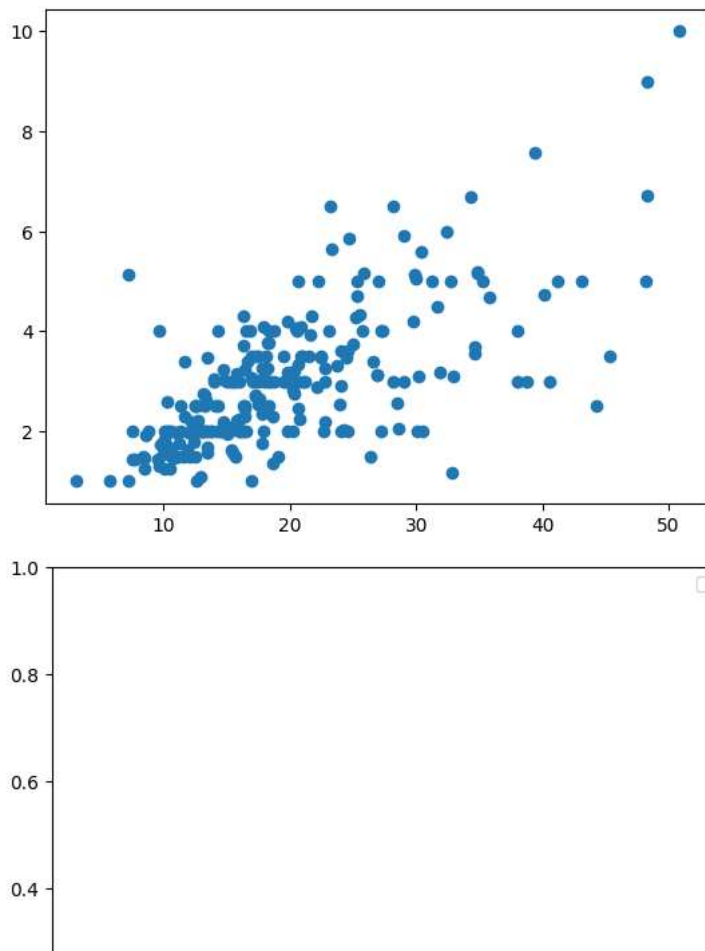
<BarContainer object of 4 artists>



```
plt.scatter(df1['total_bill'],df1['tip'])
plt.show()
```



```
plt.scatter(x='total_bill',y='tip',data=df1)
fig=plt.figure(figsize=(5,4))
ax=fig.add_axes([1,1,1,1])
ax.legend(labels=('sun','mon','tue'))
plt.show()
```

```python
import matplotlib.pyplot as plt
import pandas as pd

data = pd.read_csv('/content/tips (1).csv')

x = data['day']
y = data['total_bill']

plt.bar(x, y)
plt.title("Tips Dataset")
plt.ylabel('Total Bill')
plt.xlabel('Day')
plt.show()
```
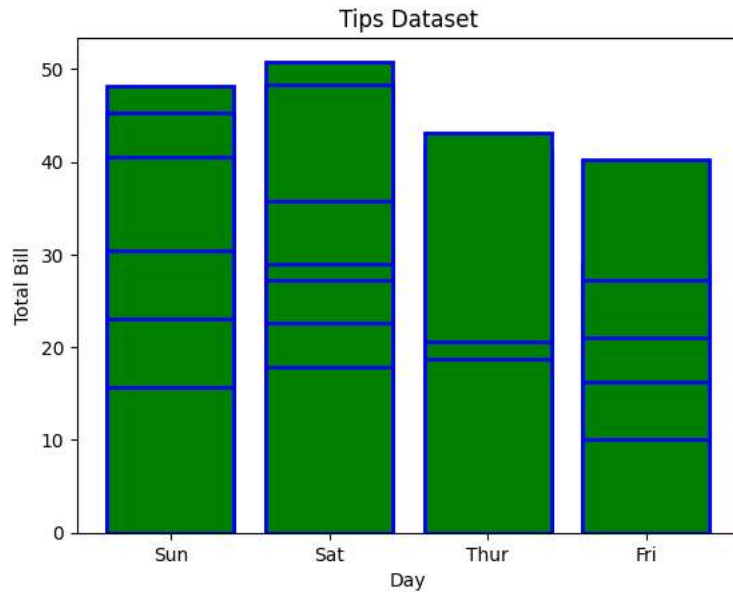
```
x = data['day']
y = data['total_bill']

plt.bar(x, y, color='green', edgecolor='blue',
        linewidth=2)
plt.title("Tips Dataset")
plt.ylabel('Total Bill')
plt.xlabel('Day')
plt.show()
```
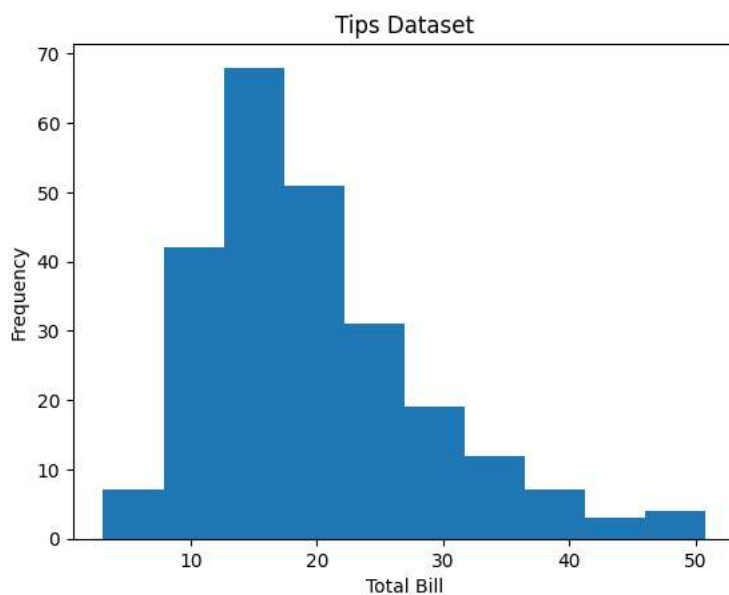


```
x = data['total_bill']
plt.hist(x)
plt.title("Tips Dataset")
plt.ylabel('Frequency')
plt.xlabel('Total Bill')
plt.show()
```
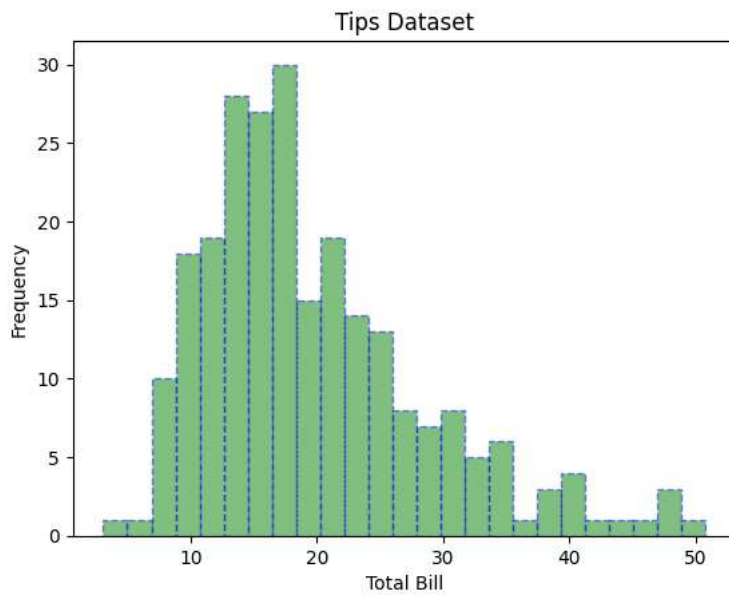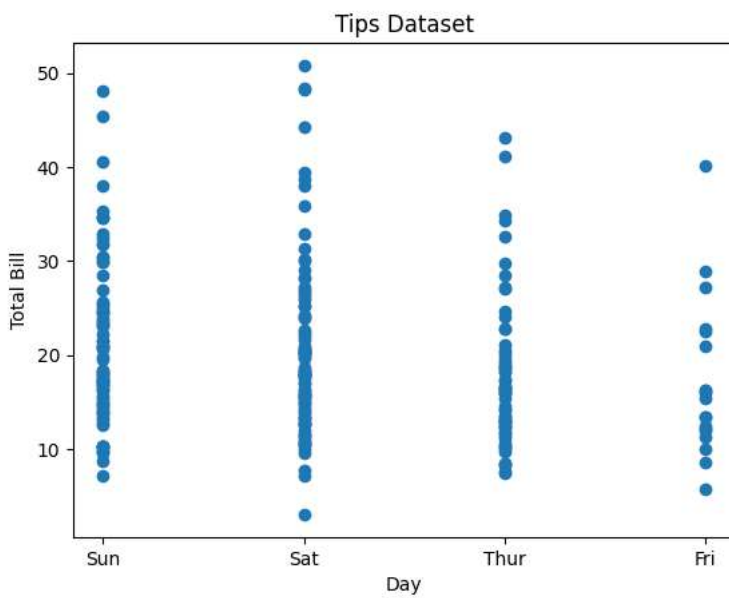


```
x = data['total_bill']
plt.hist(x, bins=25, color='green', edgecolor='blue',
        linestyle='--', alpha=0.5)
plt.title("Tips Dataset")
plt.ylabel('Frequency')
plt.xlabel('Total Bill')
```
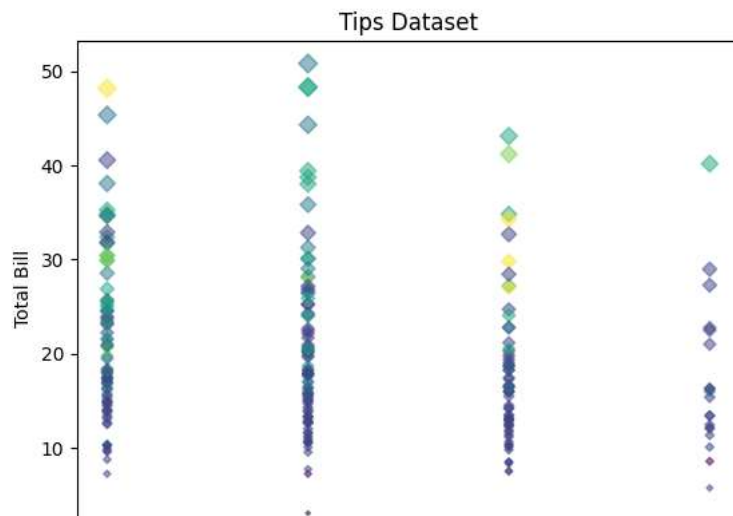
```
plt.show()
```



```
x = data['day']
y = data['total_bill']
plt.scatter(x, y)
plt.title("Tips Dataset")
plt.ylabel('Total Bill')
plt.xlabel('Day')
plt.show()
```



```
x = data['day']
y = data['total_bill']
plt.scatter(x, y, c=data['size'], s=data['total_bill'],
            marker='D', alpha=0.5)
plt.title("Tips Dataset")
plt.ylabel('Total Bill')
plt.xlabel('Day')
plt.show()
```
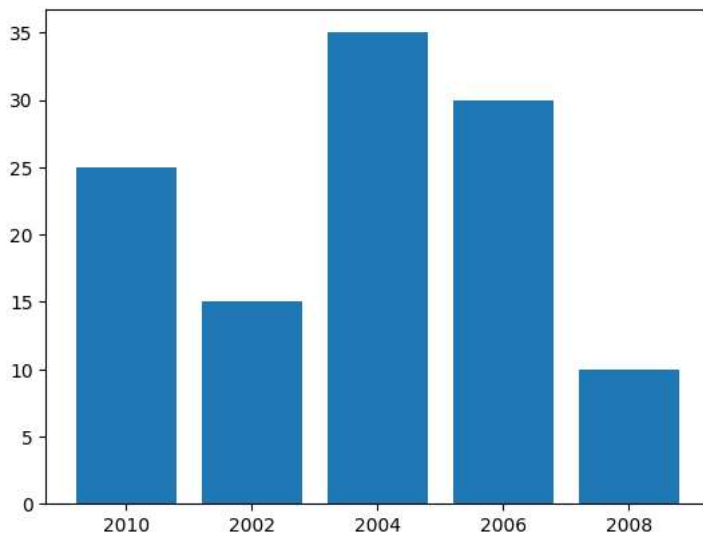
## Tips Dataset



```
cars = ['AUDI', 'BMW', 'FORD',
        'TESLA', 'JAGUAR',]
data = [23, 10, 35, 15, 12]
plt.pie(data, labels=cars)
plt.title("Car data")
plt.show()
```
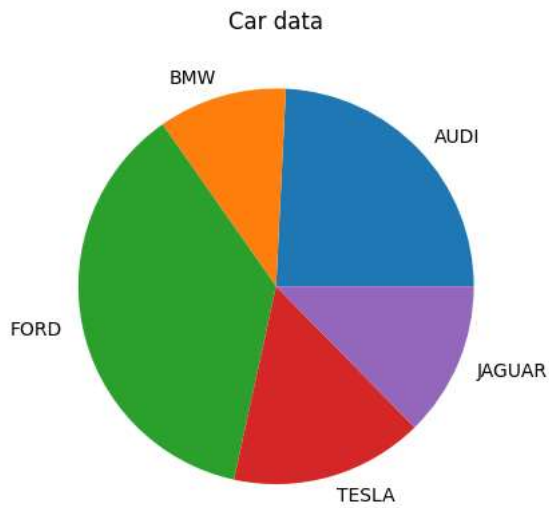
## Car data



```
cars = ['AUDI', 'BMW', 'FORD',
        'TESLA', 'JAGUAR',]
data = [23, 13, 35, 15, 12]
explode = [0.1, 0.5, 0, 0, 0]
colors = ( "orange", "cyan", "yellow",
        "grey", "green",)
plt.pie(data, labels=cars, explode=explode, autopct='%1.2f%%',
        colors=colors, shadow=True)
plt.show()
```
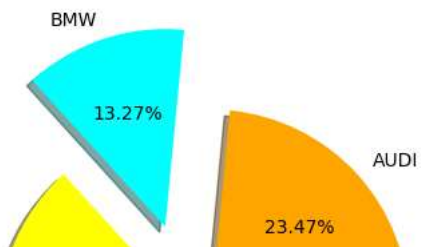
```
year = ['2010', '2002', '2004', '2006', '2008']
production = [25, 15, 35, 30, 10]
plt.bar(year, production)
plt.savefig("output1.jpg")
plt.savefig("output2", facecolor='y', bbox_inches="tight",
            pad_inches=0.3, transparent=True)
```