In [196…
```python
import matplotlib.pyplot as plt
import pandas as pd
import numpy as np
```
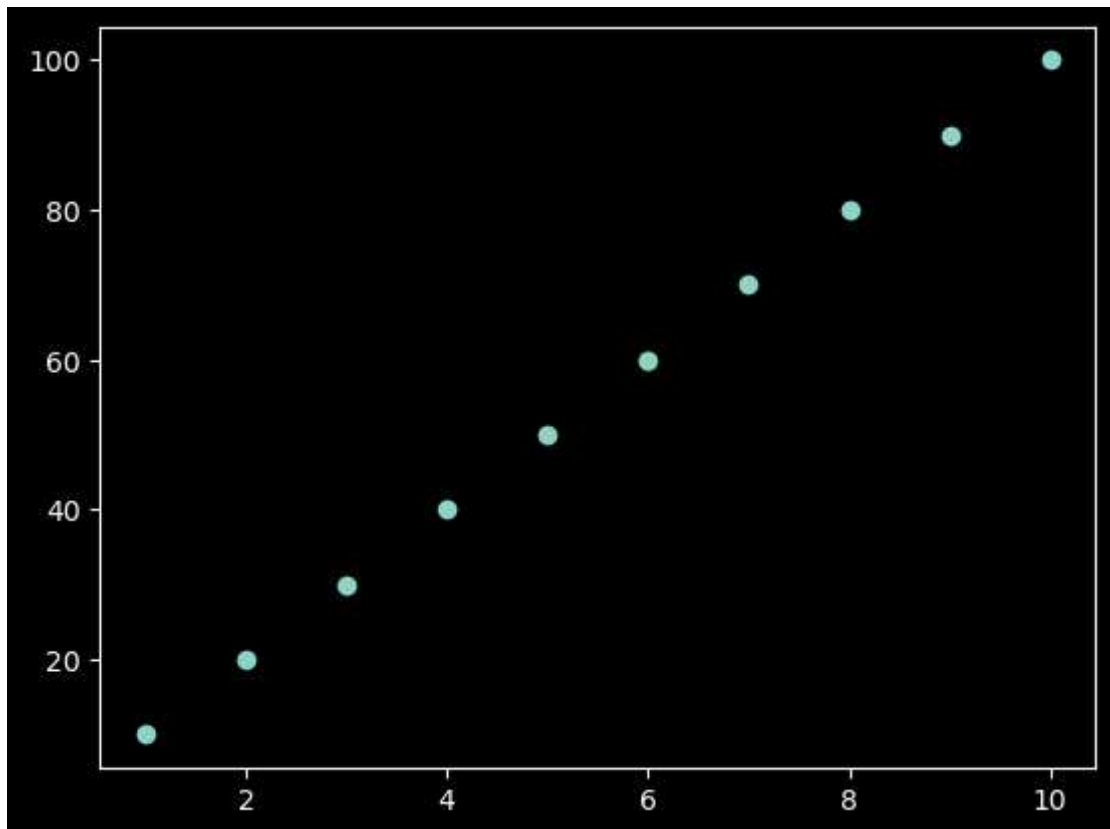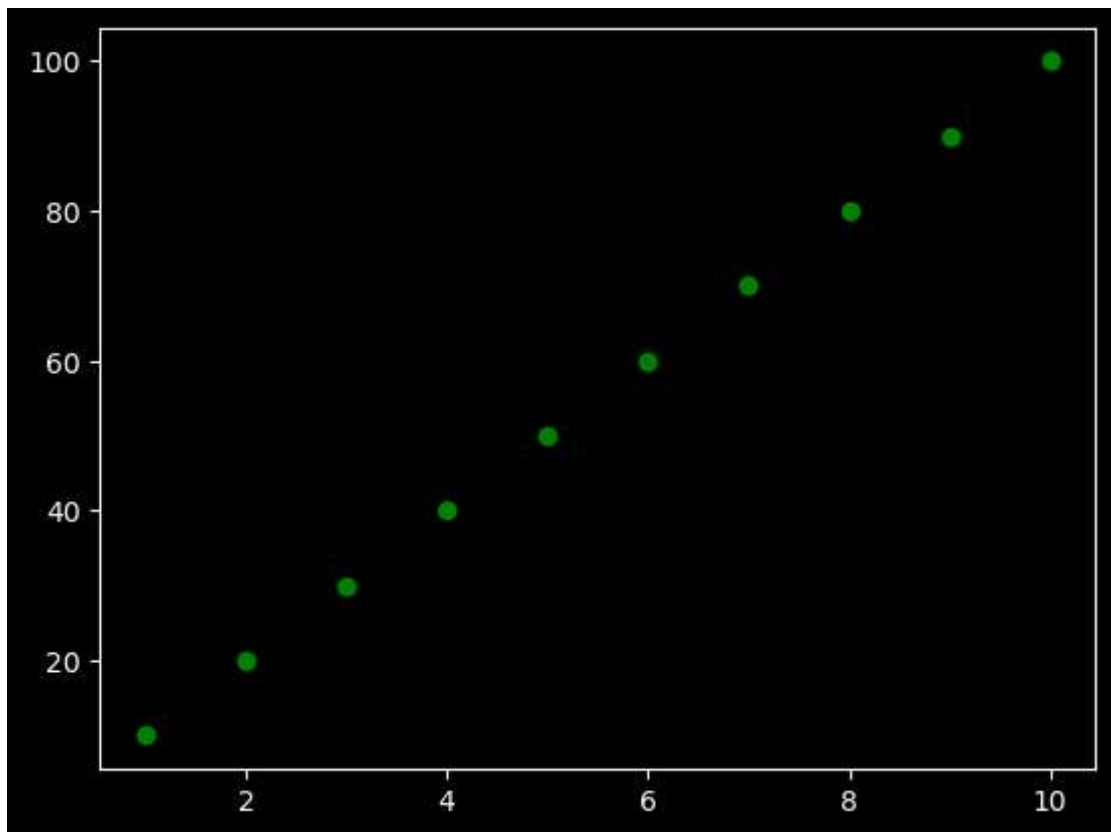
In [197…
```python
rollno = [1,2,3,4,5,6,7,8,9,10]
marks = [10, 20, 30, 40, 50, 60, 70, 80, 90, 100]
```
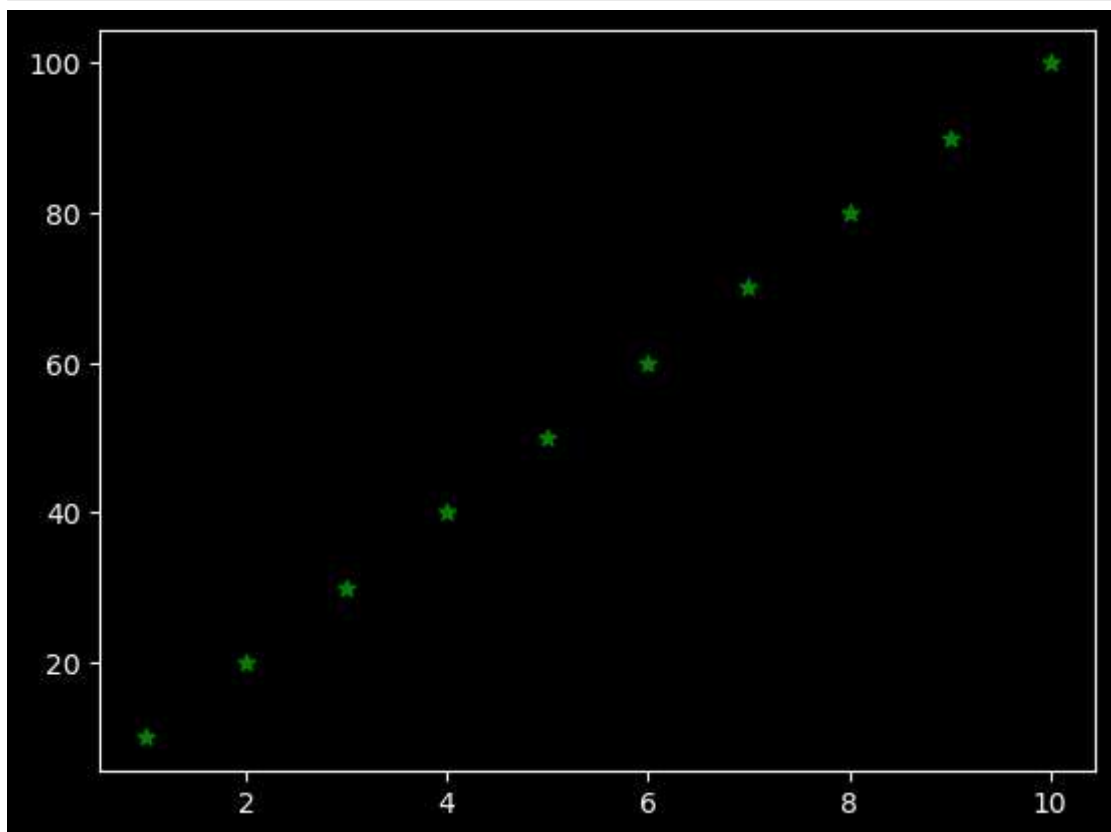
In [198…
```python
plt.scatter(rollno, marks)
plt.show()
```
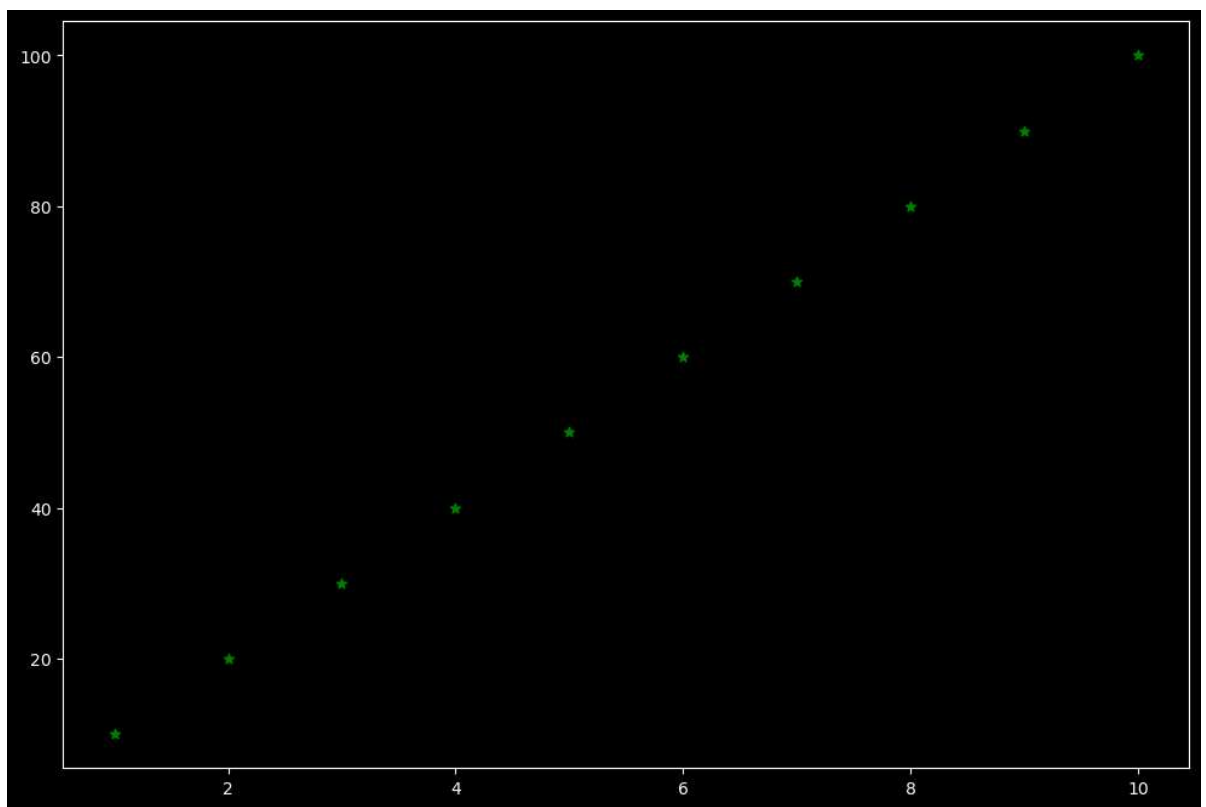

In [199…
```python
plt.scatter(rollno, marks, color = 'green')
plt.show()
```

```
In [200...  plt.scatter(rollno, marks, color = 'green', marker = '*')
            plt.show()
```
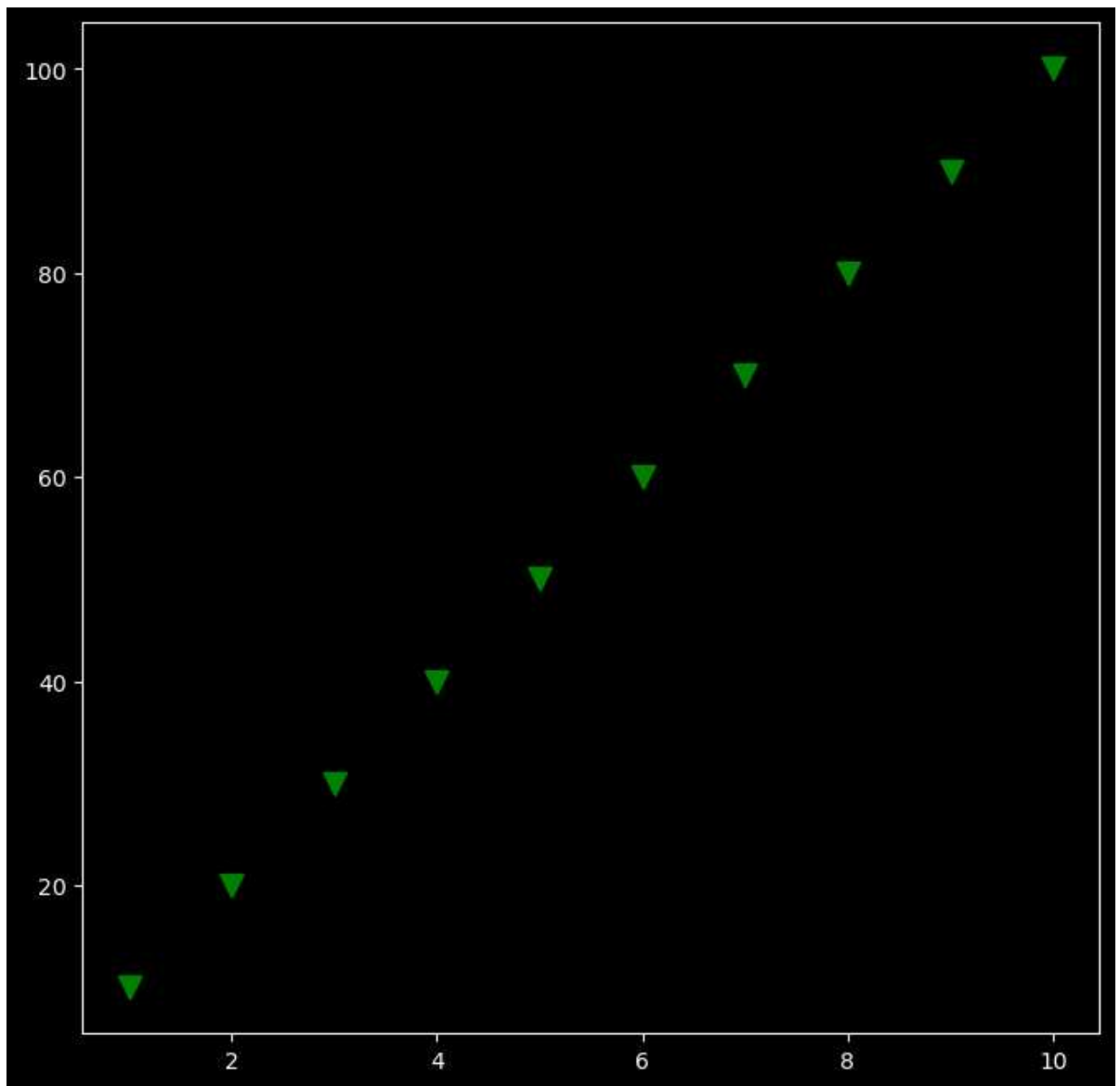


```
In [201...  plt.figure(figsize=(12,8))
            plt.scatter(rollno, marks, color = 'green', marker = '*')
            plt.show()
```

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```
In [202…   plt.figure(figsize=(8,8))
           plt.plot(rollno, marks, 'gv', markersize = 10)
           plt.show()
```

```
temperature_pune = [25,34,21,45,28,6,43,18,7,2]
humidity_pune = [28, 25,29,20, 26, 50, 19, 29, 52, 55]

temperature_bangalore = [34,35,36,37,28,27,26,25,31,20]
humidity_bangalore = [40, 38, 36, 35, 42, 44, 41, 40, 34, 45]
```

```
plt.figure(figsize=(8,8))
plt.plot(temperature_pune, humidity_pune, 'ro', markersize = 5)
plt.show()
```
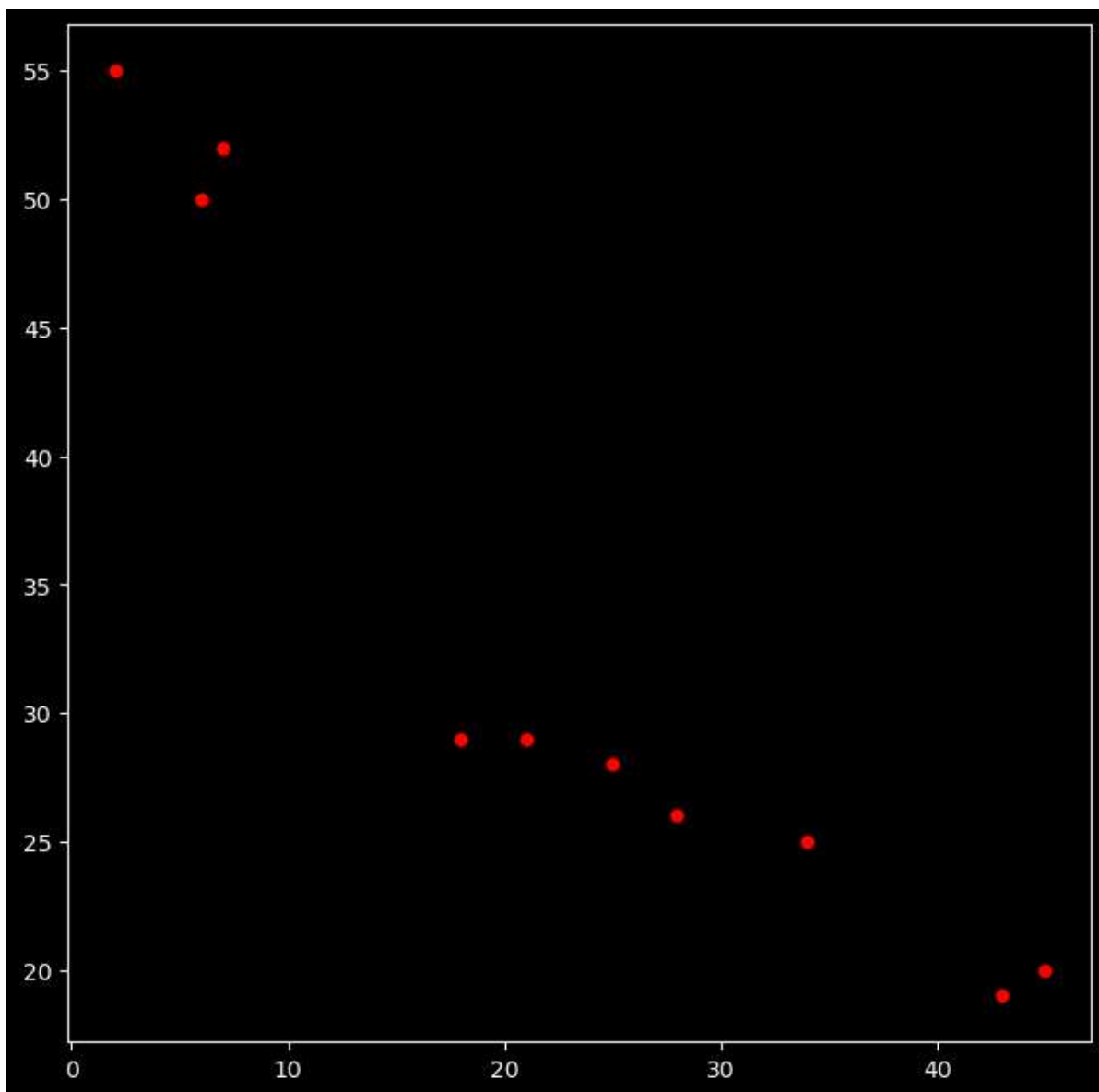
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```
In [205…   plt.figure(figsize=(8,8))
           plt.xticks(np.arange(0,60,5))
           plt.yticks(np.arange(10,60,5))

           plt.plot(temperature_pune, humidity_pune, 'ro', markersize = 5)

           plt.xlabel("Temperature")
           plt.ylabel("Humidity")
           plt.show()
```

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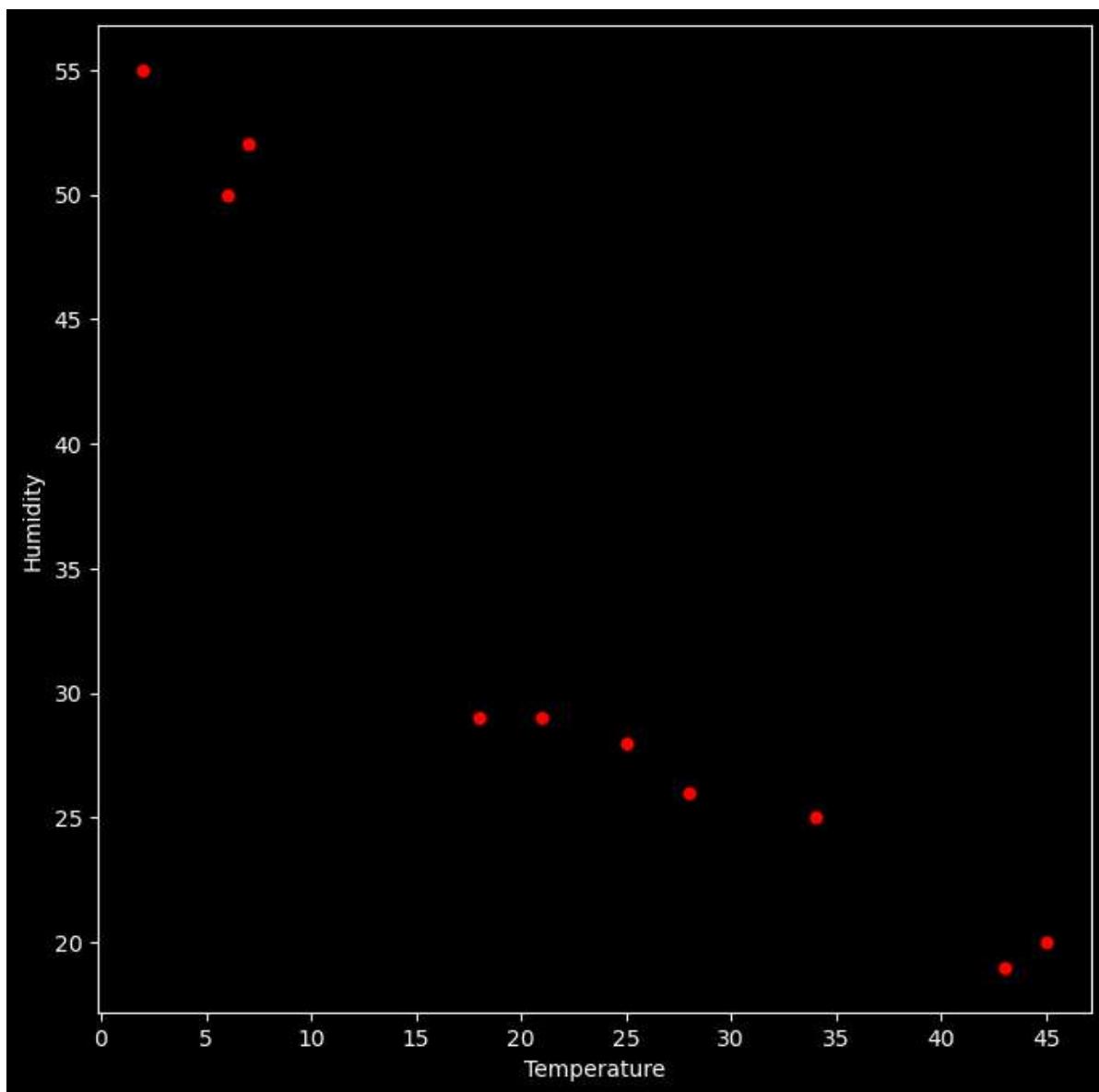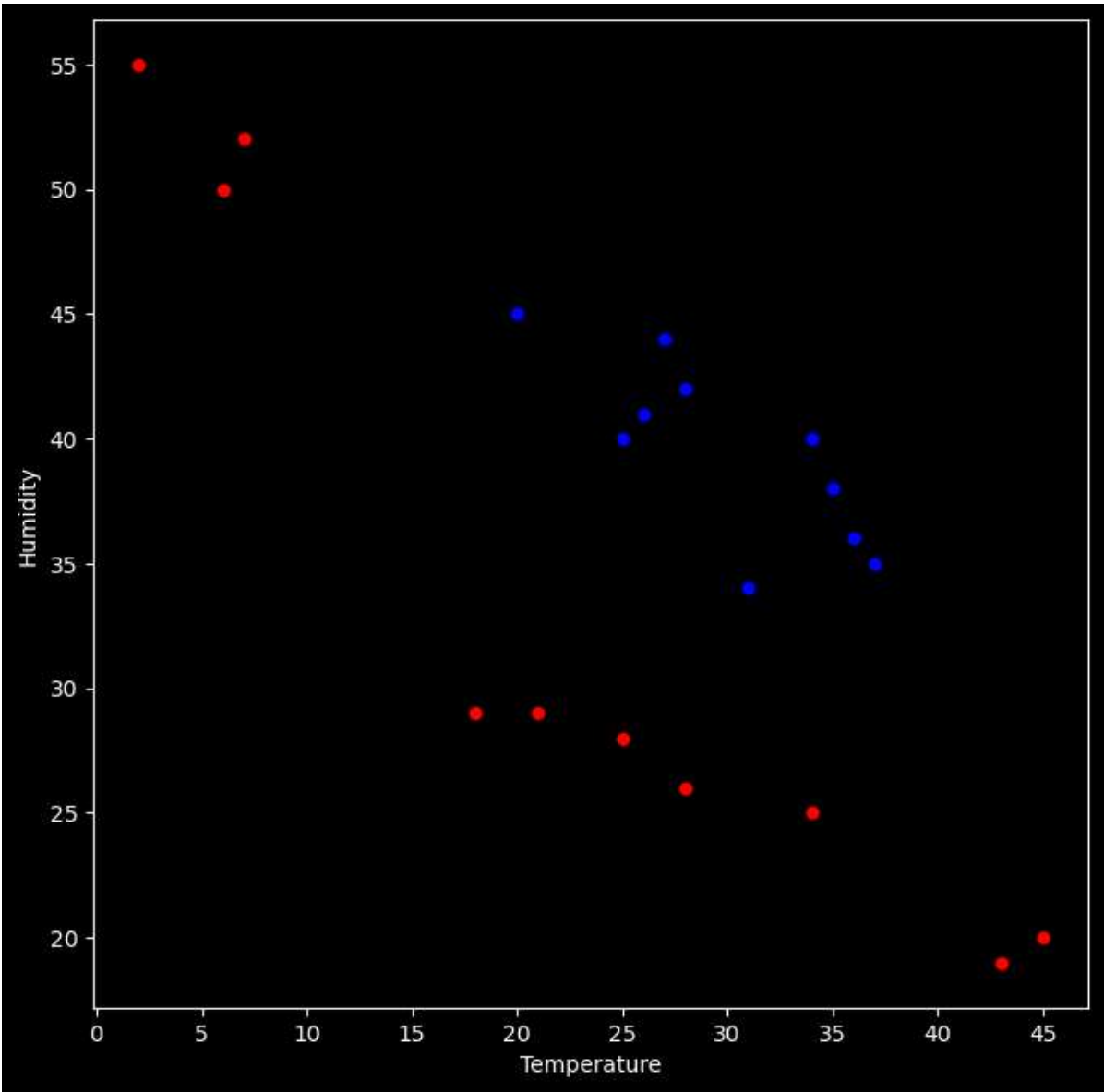
```
In [206…   plt.figure(figsize=(8,8))
           plt.xticks(np.arange(0,60,5))
           plt.yticks(np.arange(10,60,5))

           plt.plot(temperature_pune, humidity_pune, 'ro', markersize = 5)
           plt.plot(temperature_bangalore, humidity_bangalore, 'bo', markersize = 5)


           plt.xlabel("Temperature")
           plt.ylabel("Humidity")
           plt.show()
```
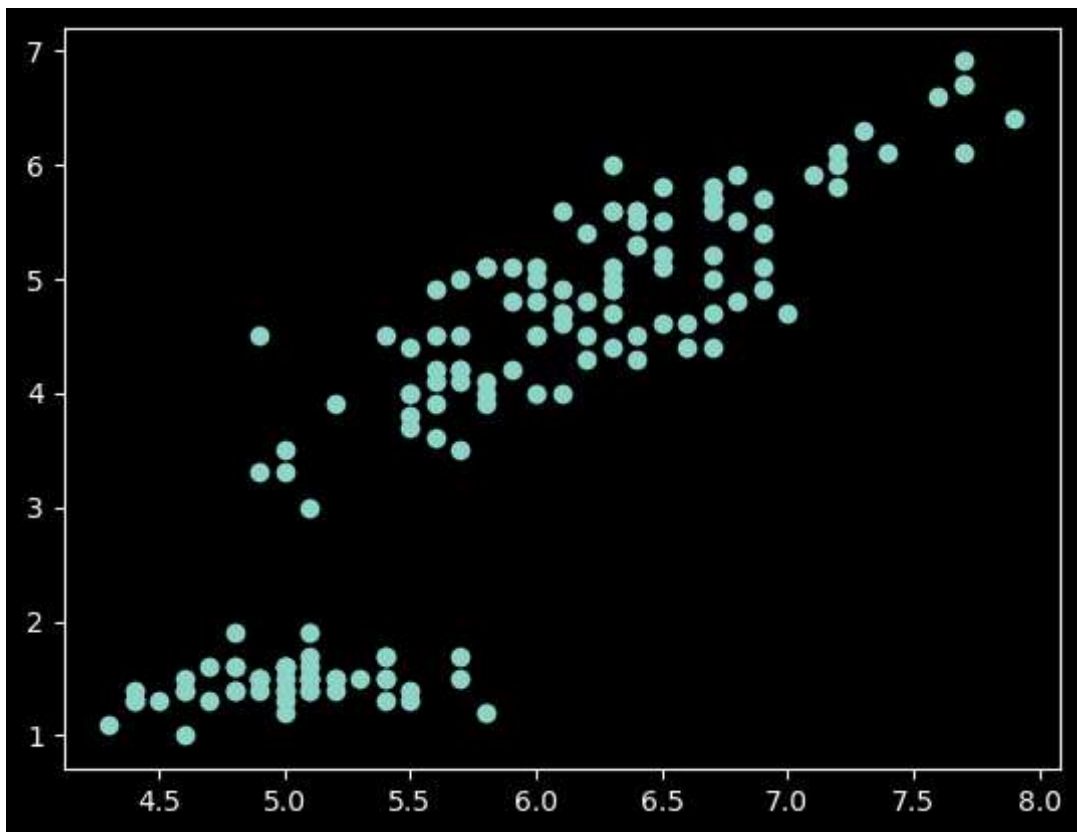
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In [207…
```python
df = pd.read_csv(r'C:\Users\harsh\Desktop\Python - Data Analysis\Matplotlib\IRIS.c
df.head()
```

Out[207]:

	sepal_length	sepal_width	petal_length	petal_width	species
0	5.1	3.5	1.4	0.2	Iris-setosa
1	4.9	3.0	1.4	0.2	Iris-setosa
2	4.7	3.2	1.3	0.2	Iris-setosa
3	4.6	3.1	1.5	0.2	Iris-setosa
4	5.0	3.6	1.4	0.2	Iris-setosa

In [208…
```python
plt.scatter(df['sepal_length'], df['petal_length'])
plt.show()
```

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```
plt.plot(df['sepal_width'], df['petal_width'], 'go')
plt.show()
```
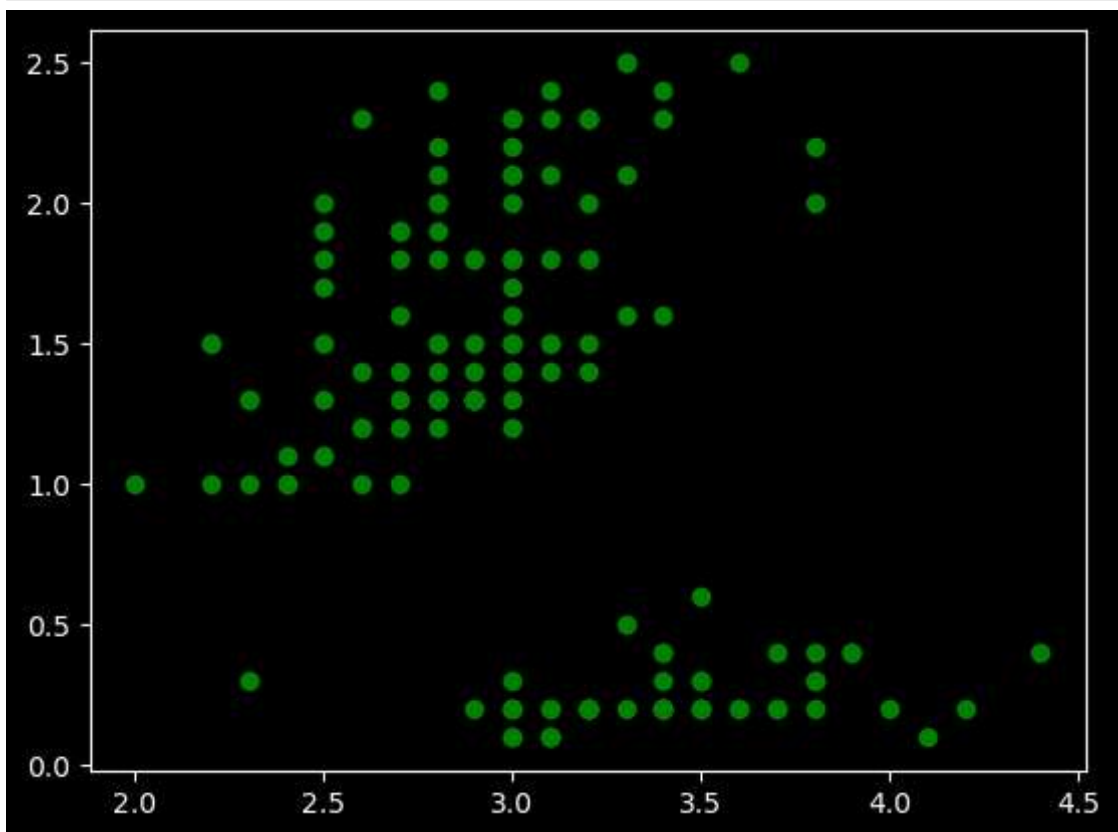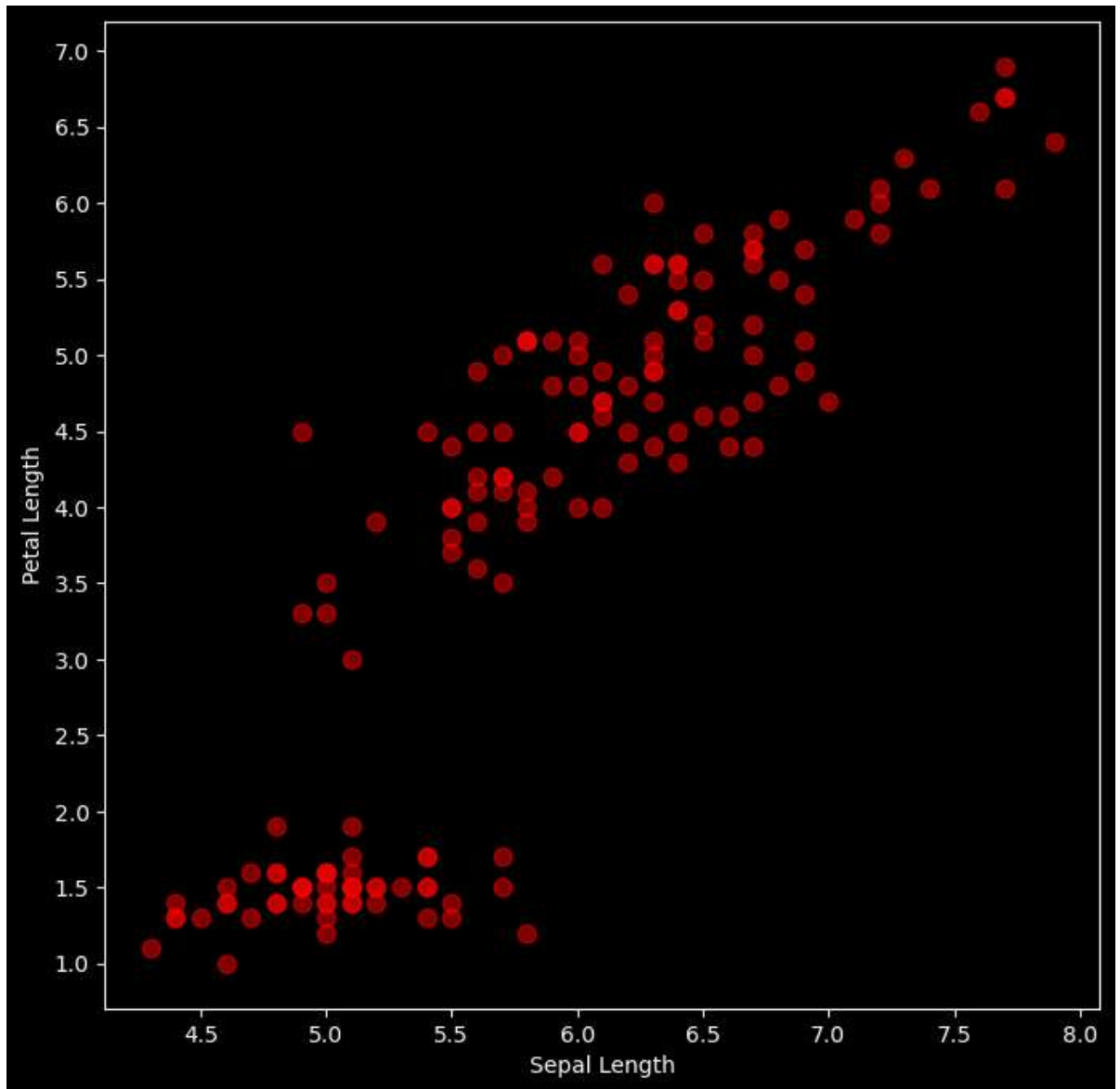


```
plt.figure(figsize = (8,8))
plt.xticks(np.arange(1,10, 0.5))
plt.yticks(np.arange(1,10, 0.5))

plt.plot(df['sepal_length'], df['petal_length'], 'ro', alpha = 0.5, markersize = 8
```
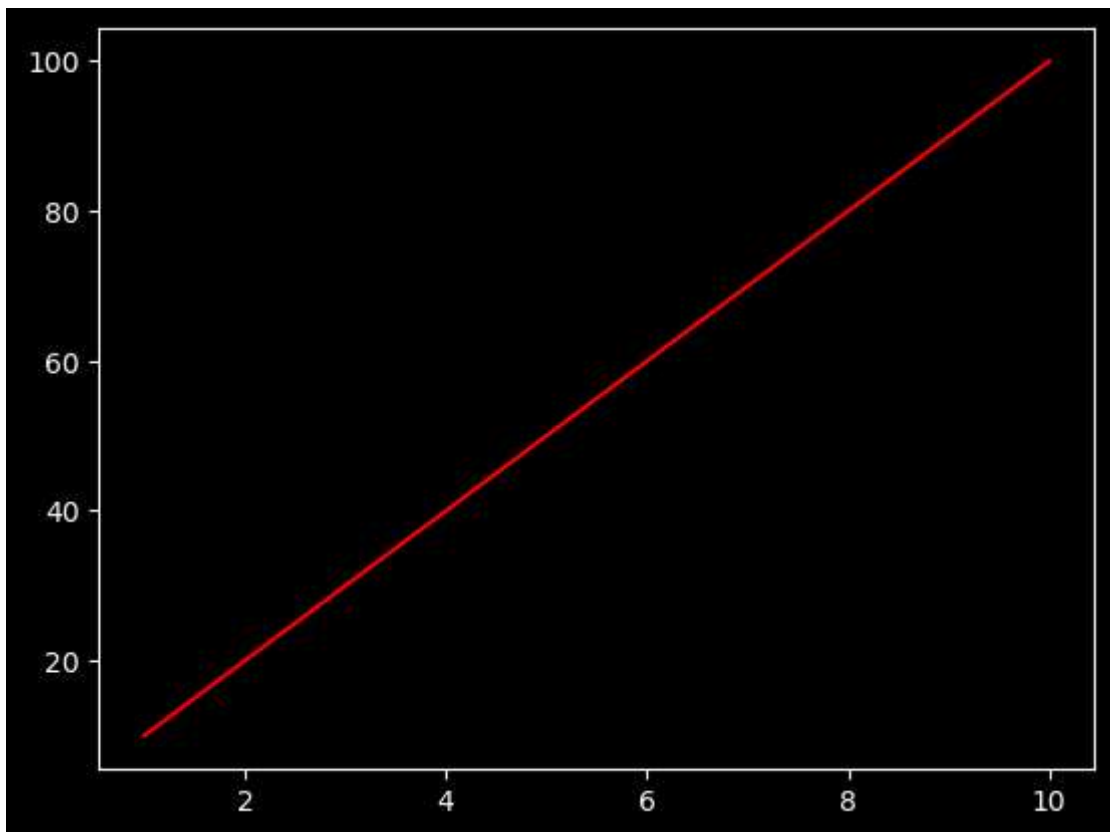
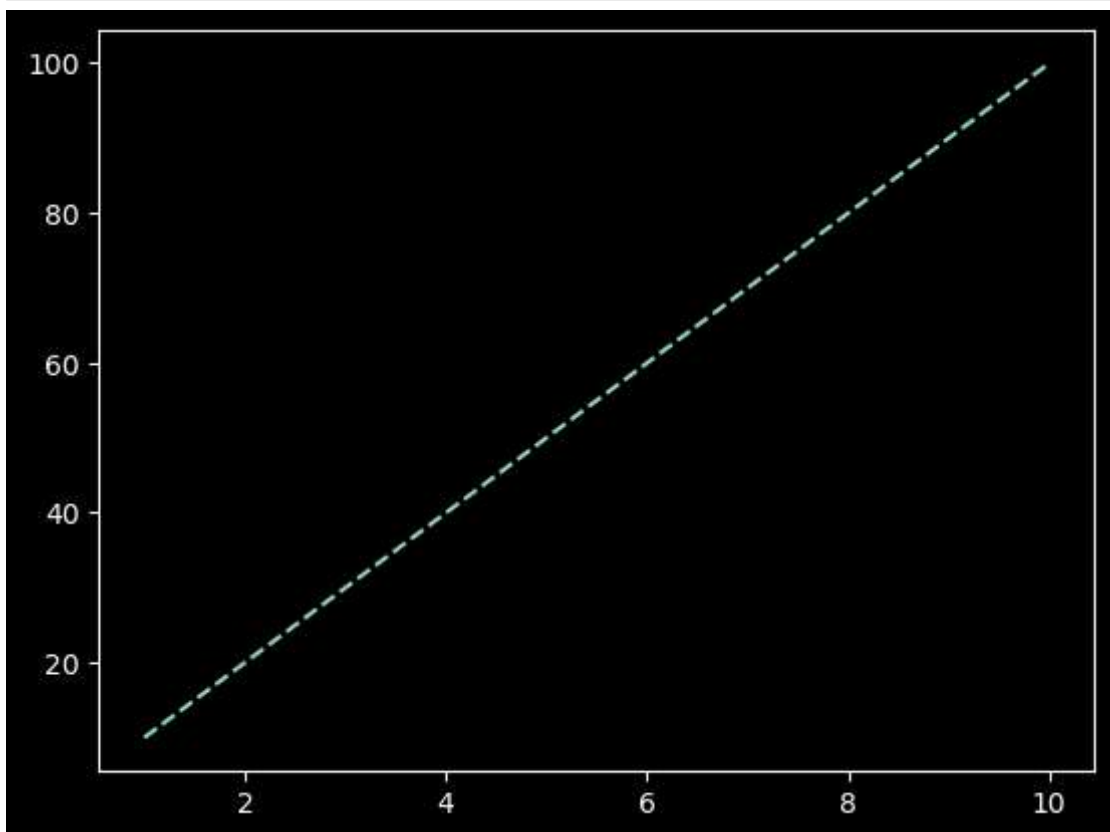Loading [MathJax]/jax/output/CommonHTML/fonts/TeX/fontdata.js

```
plt.ylabel('Petal Length')
plt.show()
```


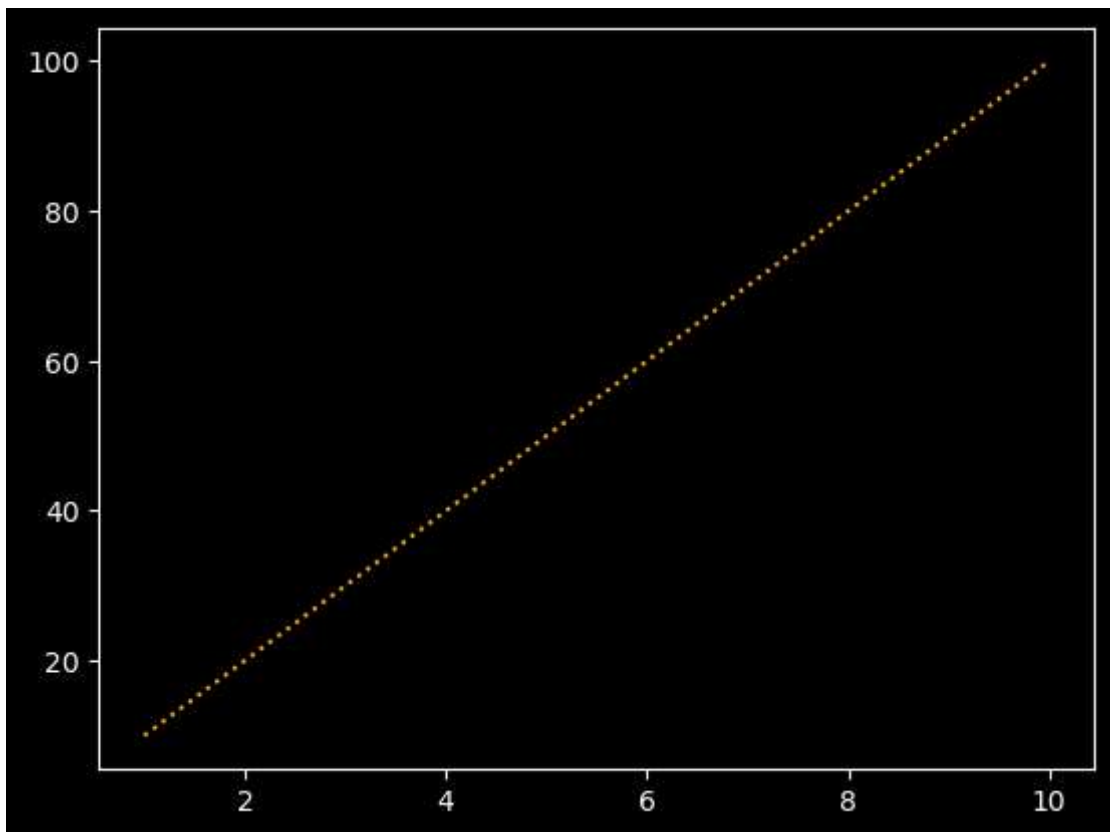```
In [211…   plt.plot(rollno, marks, 'r-')
           plt.show()
```
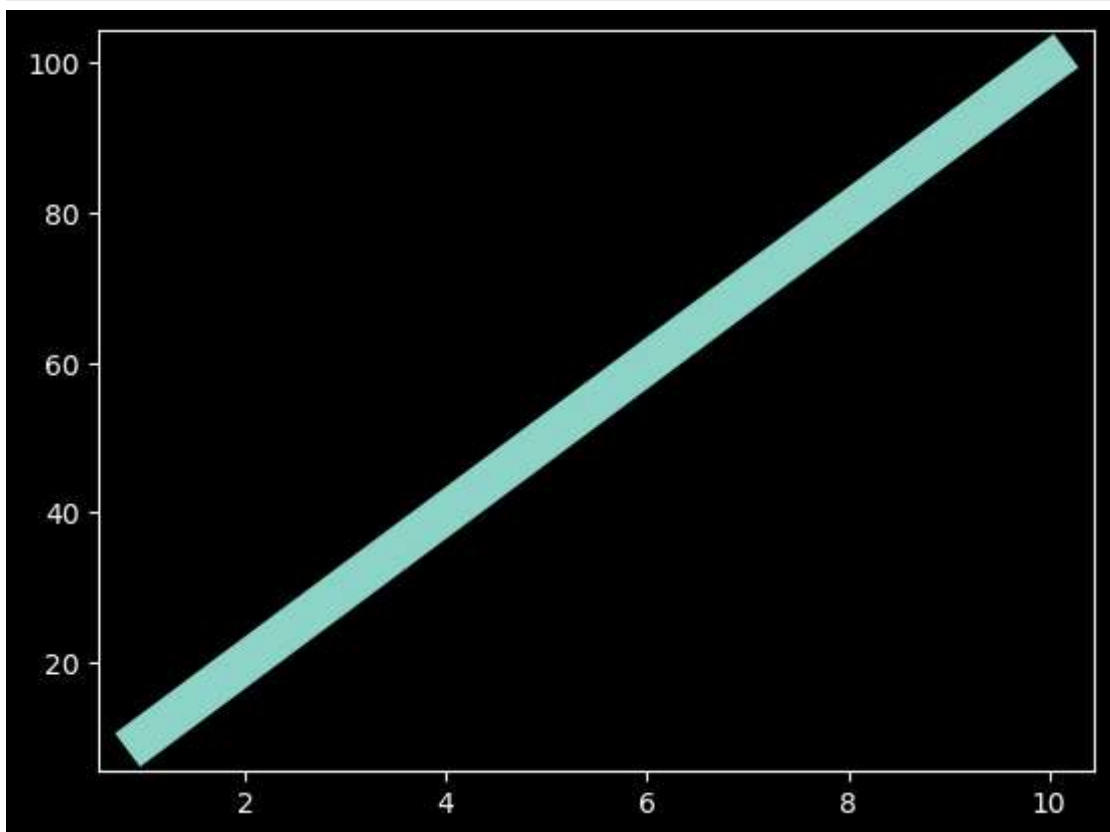
```
plt.plot(rollno, marks, linestyle = '--')
plt.show()
```



```
plt.plot(rollno, marks, linestyle = ':', color = 'orange')
plt.show()
```

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```
In [214…   plt.plot(rollno, marks, linestyle = '-', linewidth = 15)
           plt.show()
```
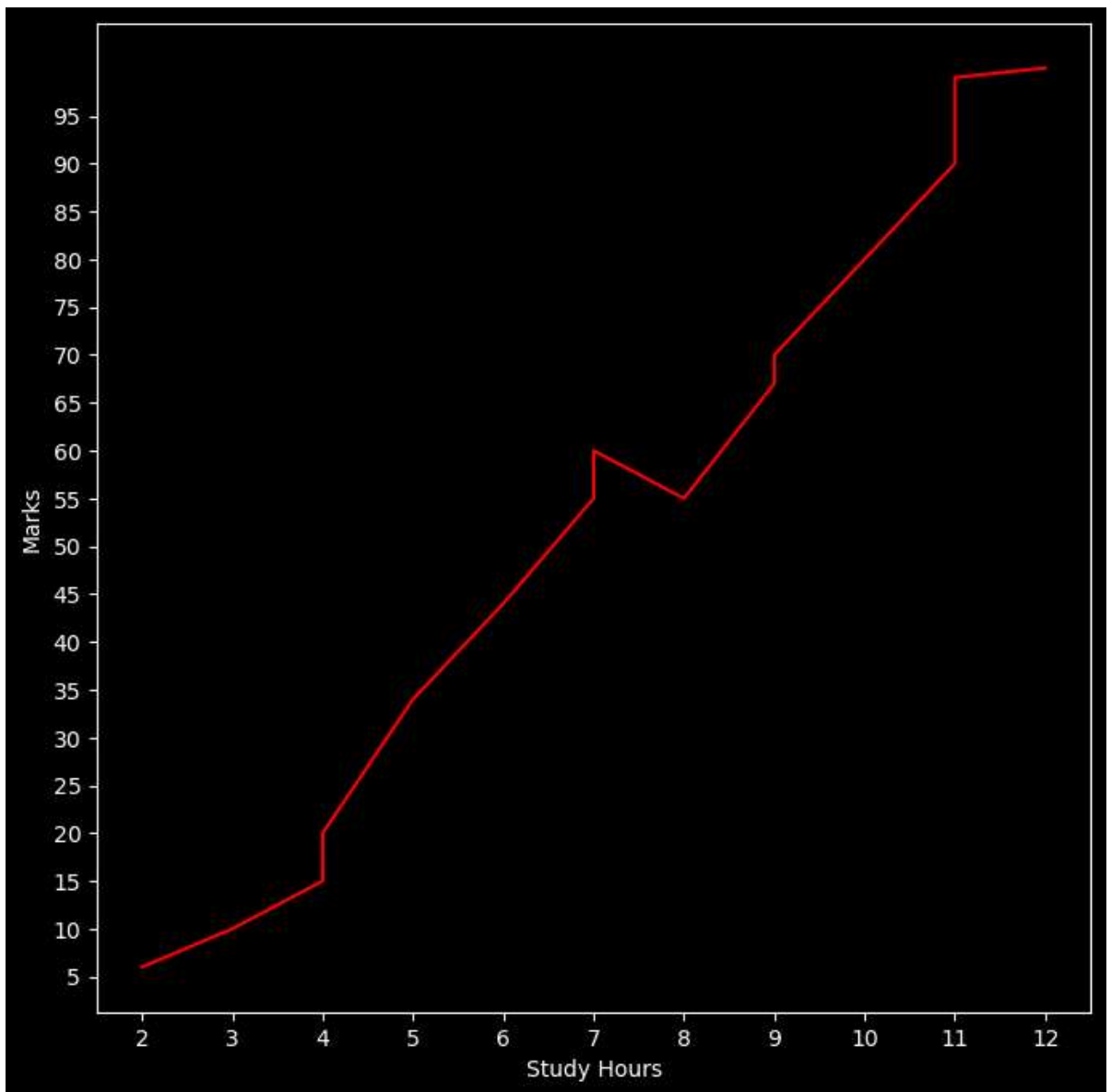


```
In [215…   study_hours = [2,3,4,4, 5, 6, 7, 7, 8, 9, 9, 10, 11, 11, 12]
           marks = [6, 10, 15, 20, 34, 44, 55, 60, 55, 67, 70, 80, 90, 99, 100]
```

```
In [216…   plt.figure(figsize=(8,8))
           plt.xticks(np.arange(0,15,1))
           plt.yticks(np.arange(0,100,5))
```

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```python
plt.plot(study_hours, marks, 'r-')

plt.xlabel("Study Hours")
plt.ylabel("Marks")
plt.show()
```
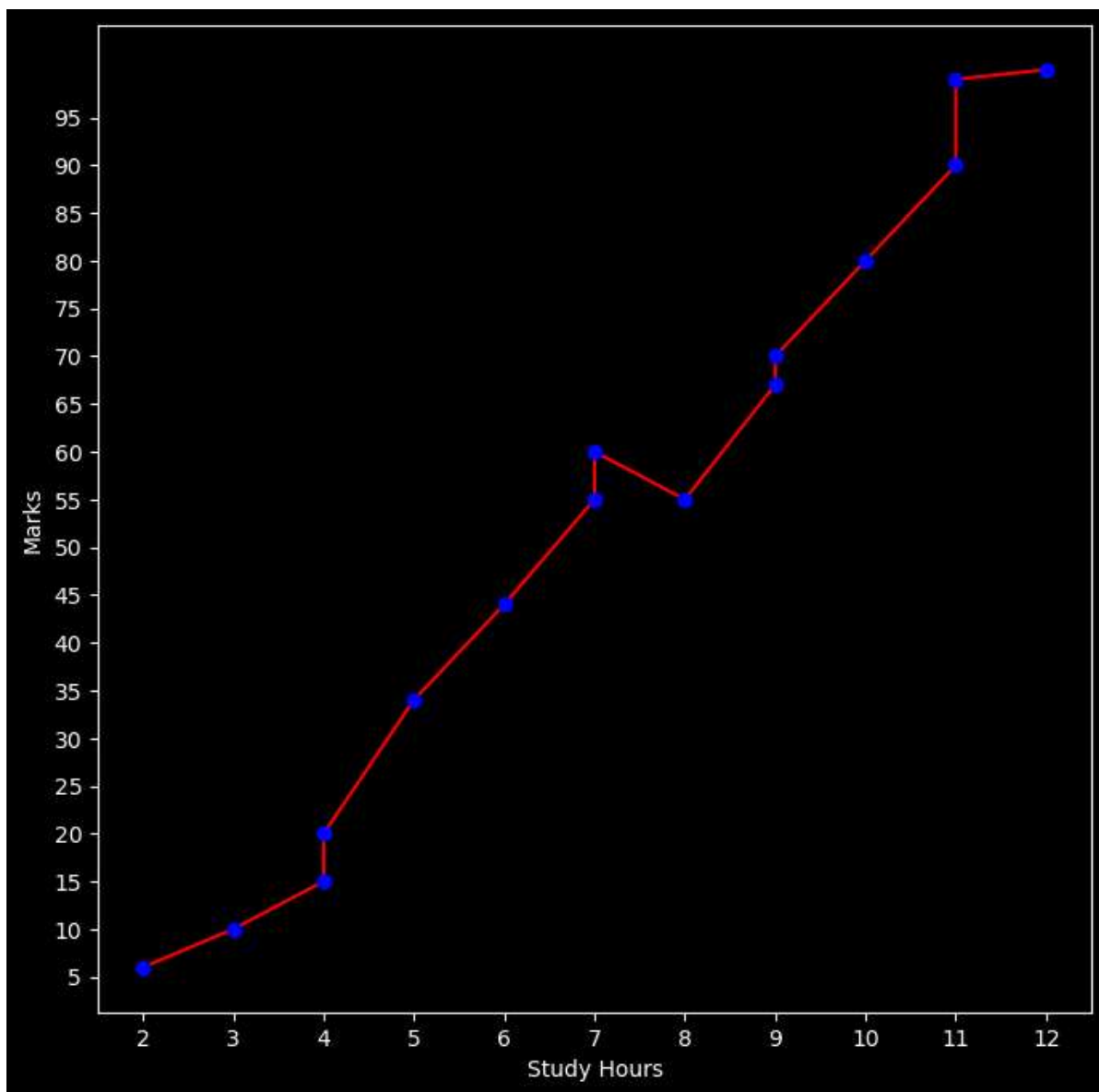


```python
In [217…  plt.figure(figsize=(8,8))
          plt.xticks(np.arange(0,15,1))
          plt.yticks(np.arange(0,100,5))

          plt.plot(study_hours, marks, 'r-')
          plt.plot(study_hours, marks, 'bo')

          plt.xlabel("Study Hours")
          plt.ylabel("Marks")
          plt.show()
```
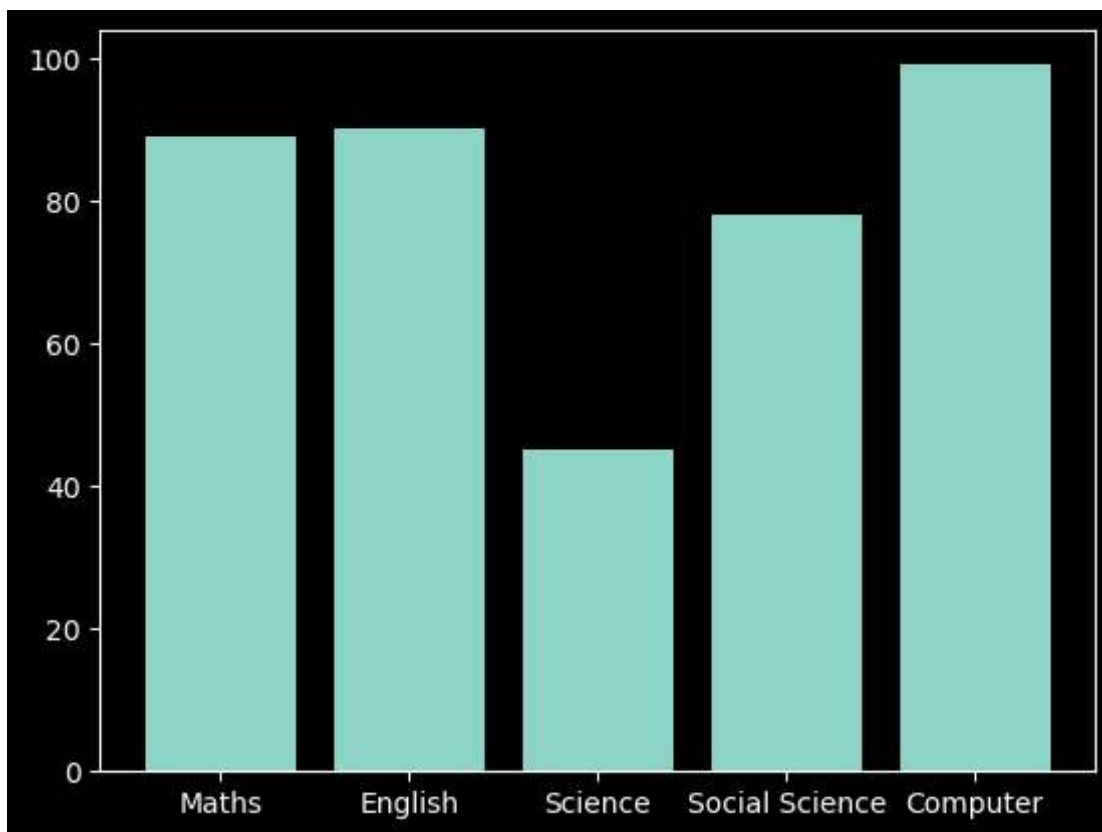
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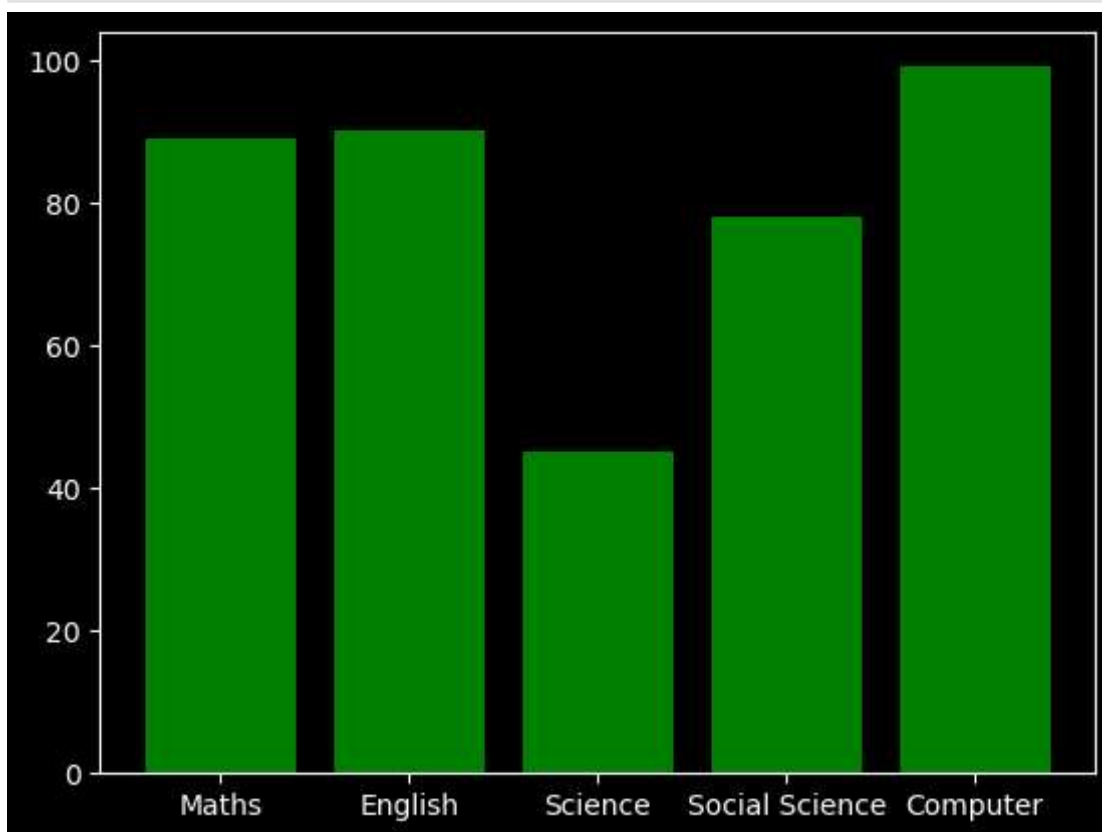
```
subjects = ["Maths", "English", "Science", "Social Science", "Computer"]
marks = [89,90,45,78,99]
```

```
plt.bar(subjects, marks)
plt.show()
```

```
plt.bar(subjects, marks, color = 'green')
plt.show()
```



```
colors = ['red', 'blue', 'green', 'orange', 'purple']
plt.bar(subjects, marks, color = colors)
plt.show()
```

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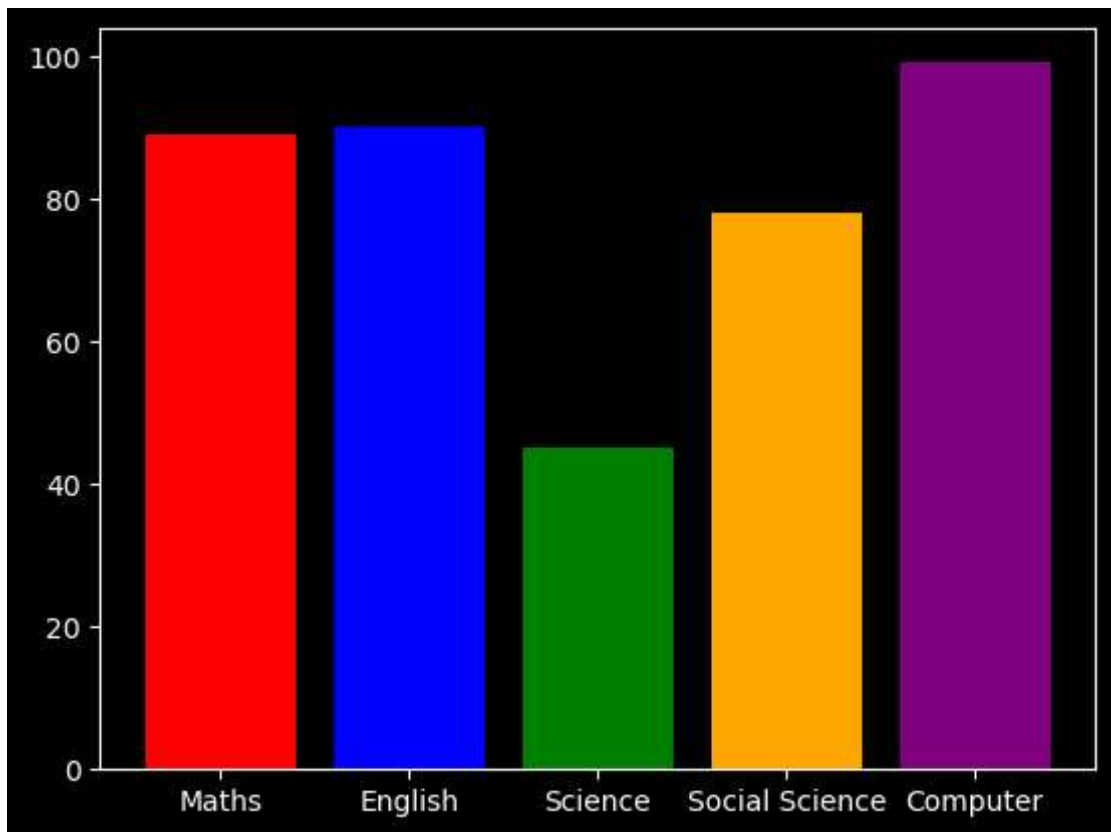
```
In [222…  plt.bar(subjects, marks, color = colors, width = 0.6)
          plt.show()
```
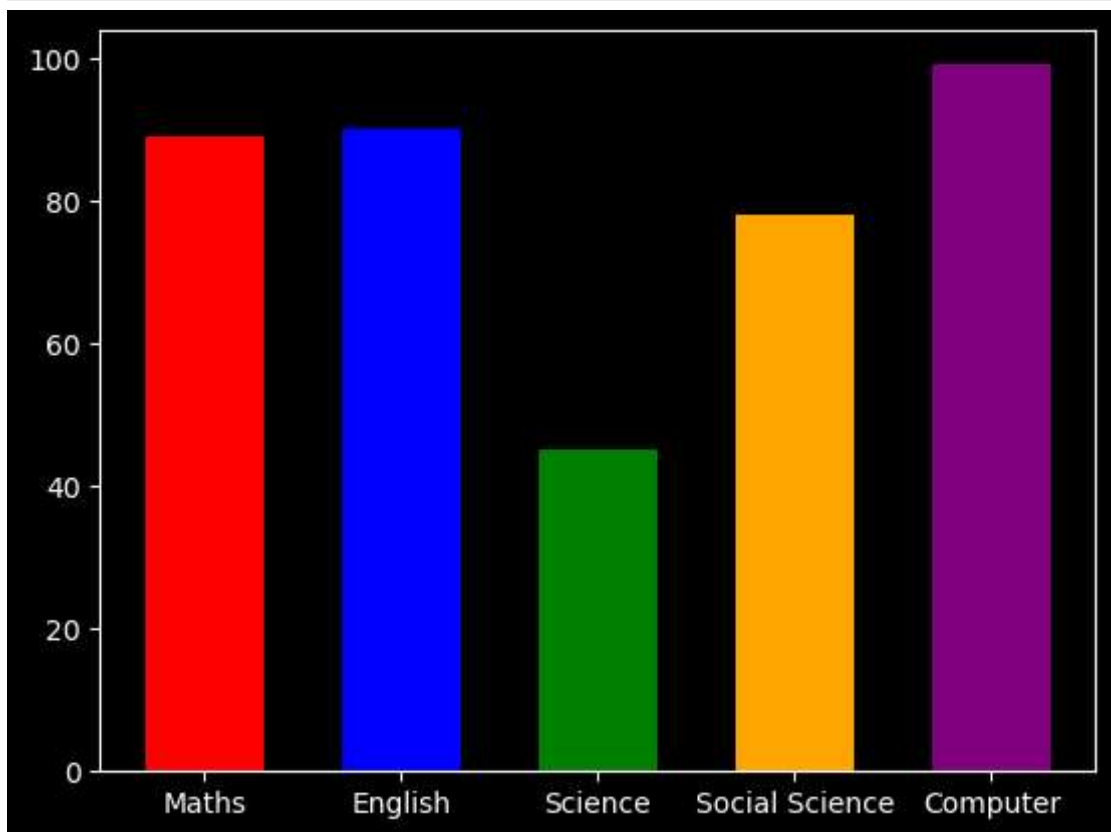


```
In [223…  plt.bar(subjects, marks, color = colors, edgecolor = 'white')
          plt.show()
```

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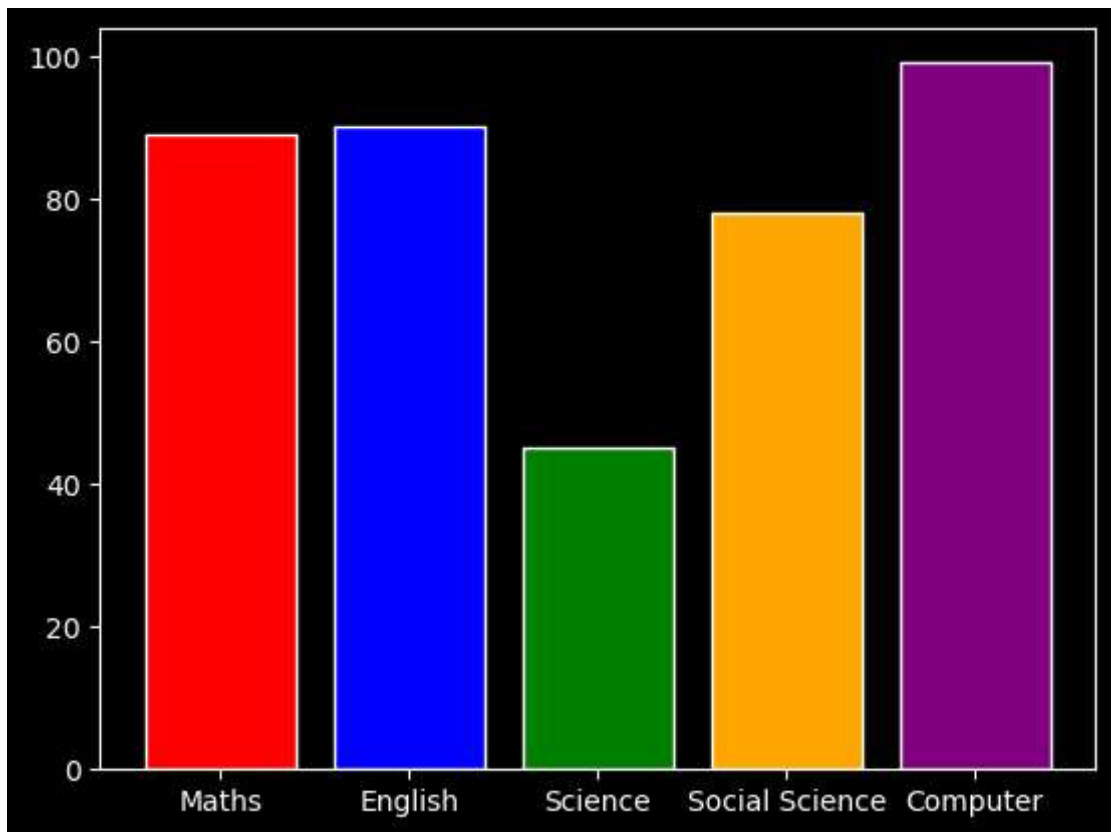
```
In [224…   plt.bar(subjects, marks, color = colors, edgecolor = 'white', linewidth = 4)
           plt.show()
```
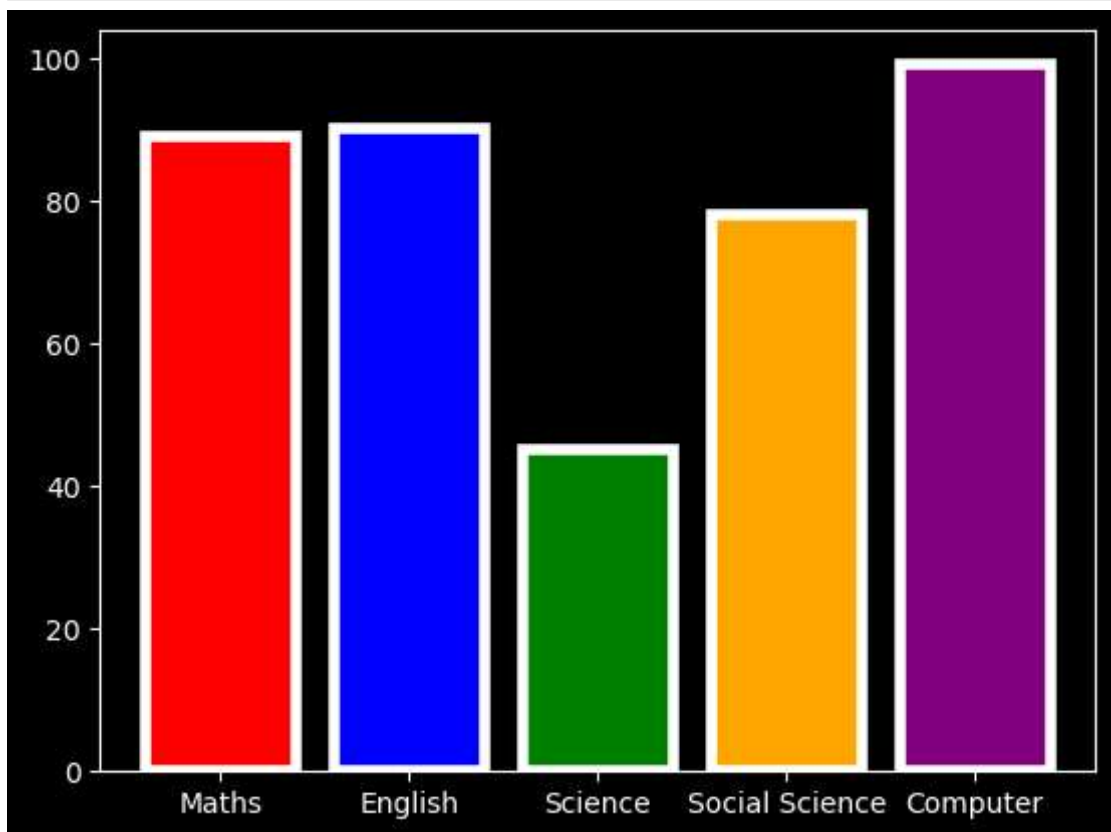


```
In [225…   plt.bar(subjects, marks, color = colors, edgecolor = 'white', linewidth = 4, lines
           plt.show()
```

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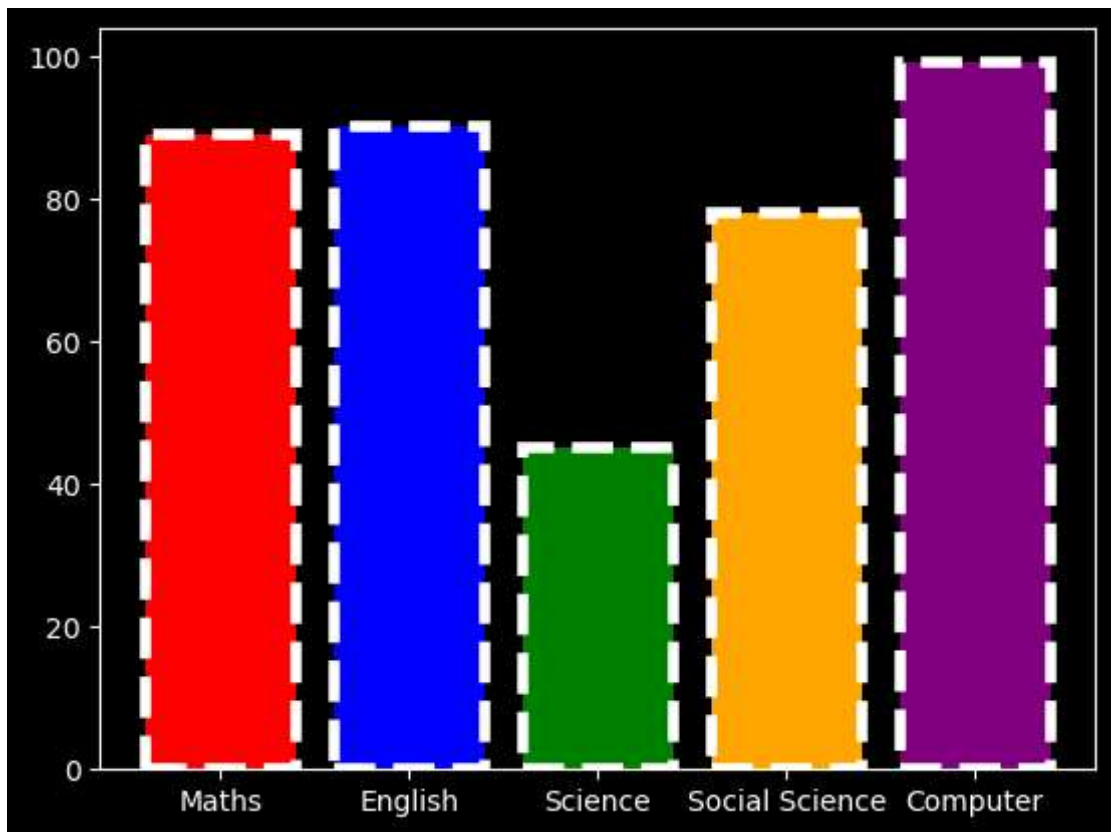
```
In [226…   plt.barh(subjects, marks, color = colors)
           plt.show()
```
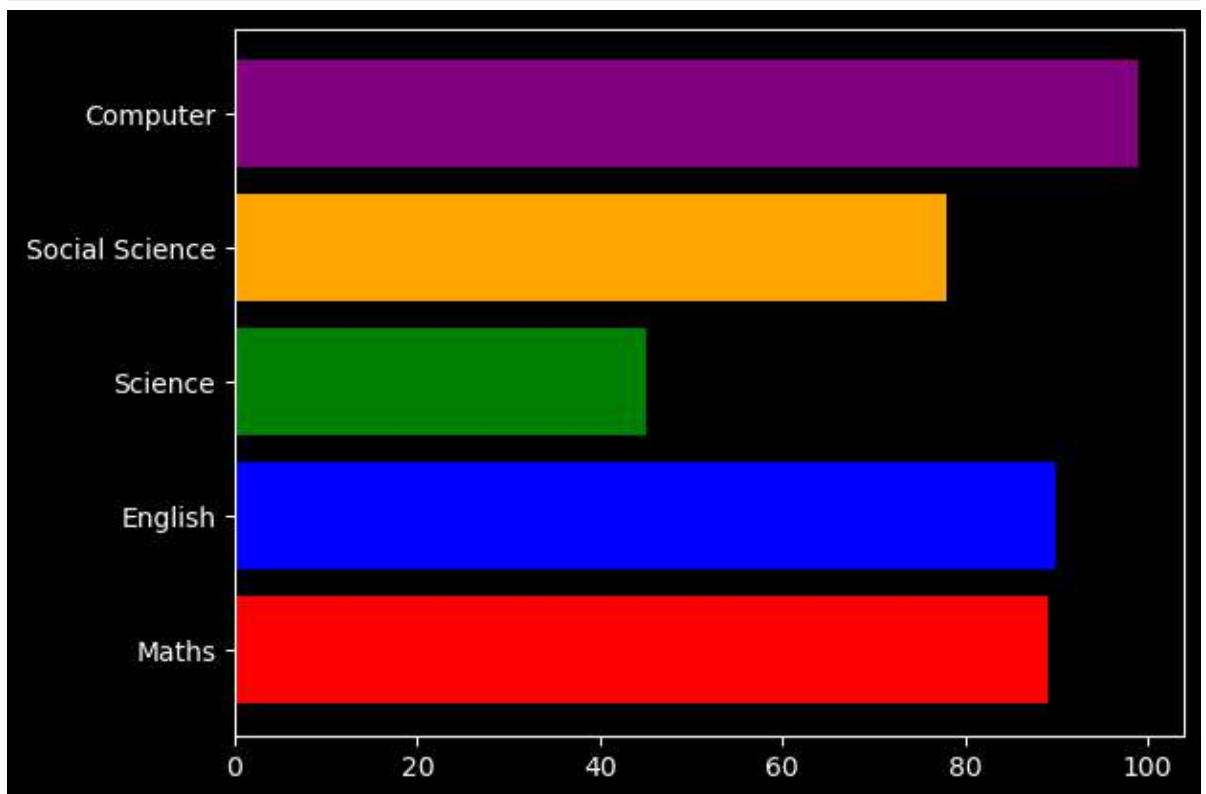


```
In [227…   subjects = ['Maths', 'English', 'Science', 'Social Studies', 'Computer']
           marks1 = [89, 90, 45, 78, 99]
           marks2 = [78, 56, 34, 90, 12]
```

```
In [228…   plt.figure(figsize=(8,8))

           plt.bar(subjects, marks1)
```

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```
plt.xlabel("Subject")
plt.ylabel("Marks")
plt.show()
```
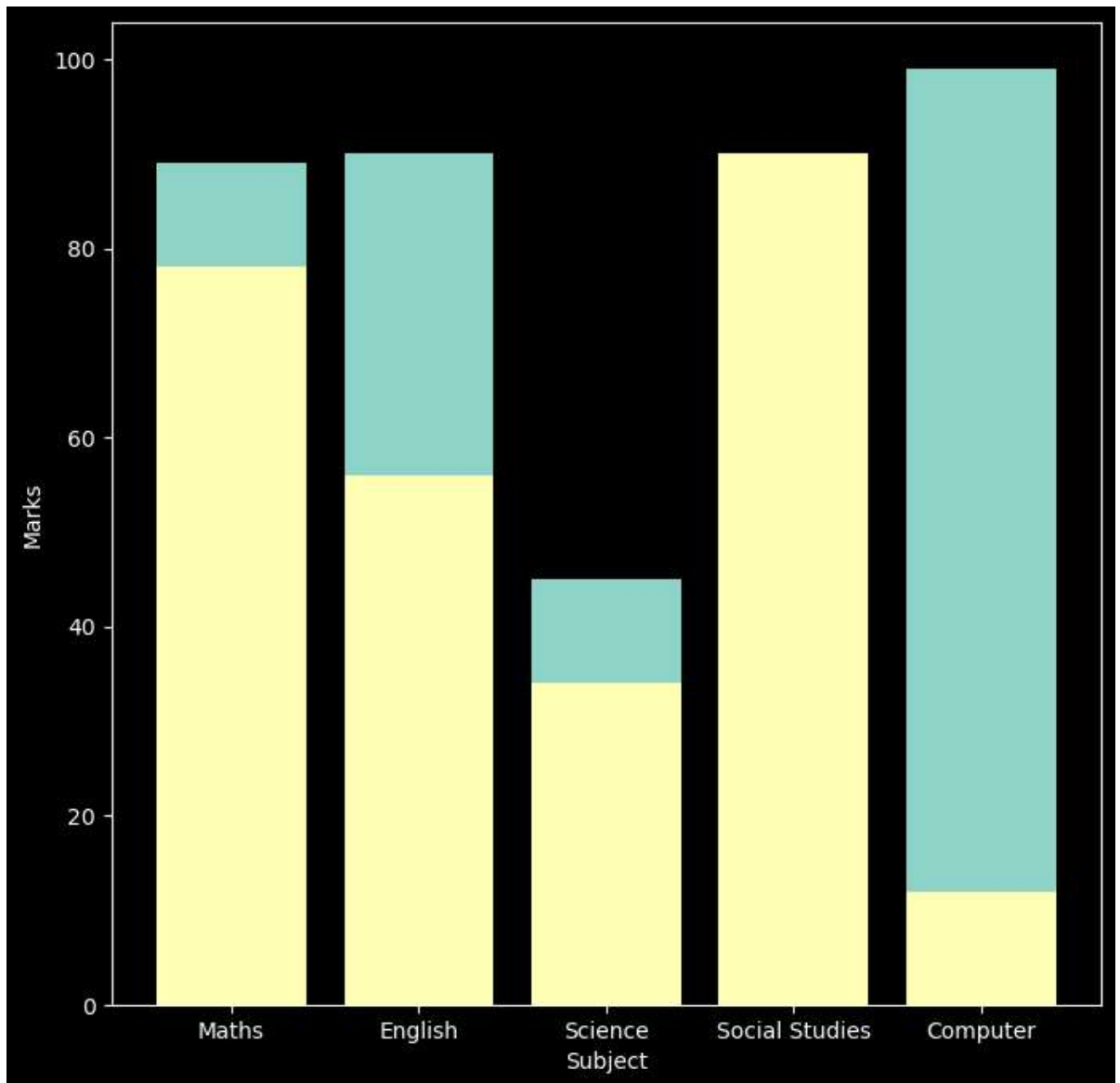

In [229...
```
subjects_len = np.arange(len(subjects))
width = 0.4
```

In [230...
```
plt.figure(figsize=(8,8))

plt.bar(subjects_len, marks1, width = width)
plt.bar(subjects_len + width, marks2, width = width)

plt.xlabel("Subject")
plt.ylabel("Marks")
plt.show()
```

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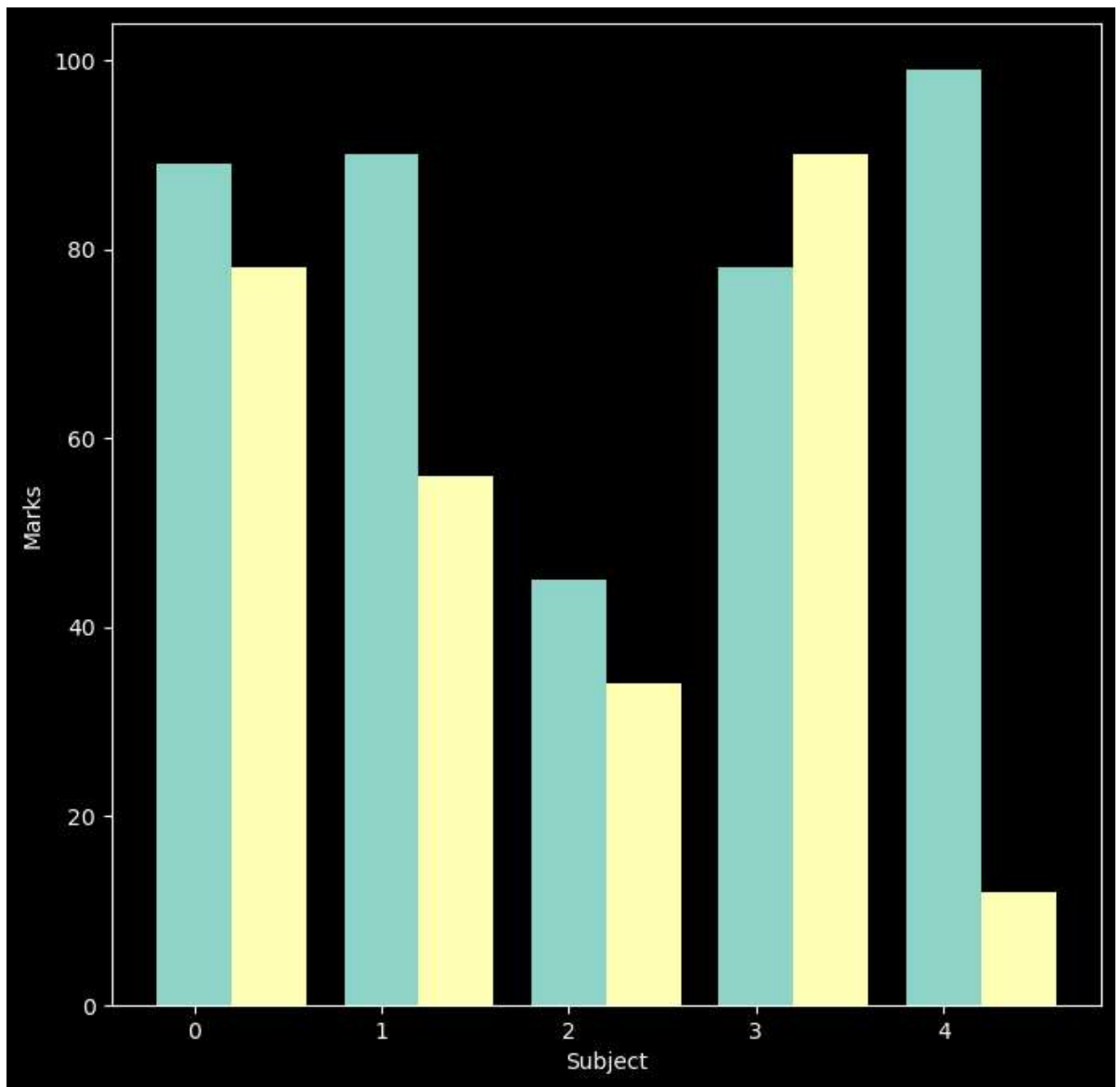
```
In [231...   plt.figure(figsize=(8,8))

            plt.bar(subjects_len, marks1, width = width, color = colors)
            plt.bar(subjects_len + width, marks2, width = width, color = colors, alpha = 0.5)

            plt.xlabel("Subject")
            plt.ylabel("Marks")
            plt.show()
```

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```
In [232...   df = pd.read_csv(r'C:\Users\harsh\Desktop\Python - Data Analysis\Matplotlib\SUPERM/
            df.head()
```

Out[232]:

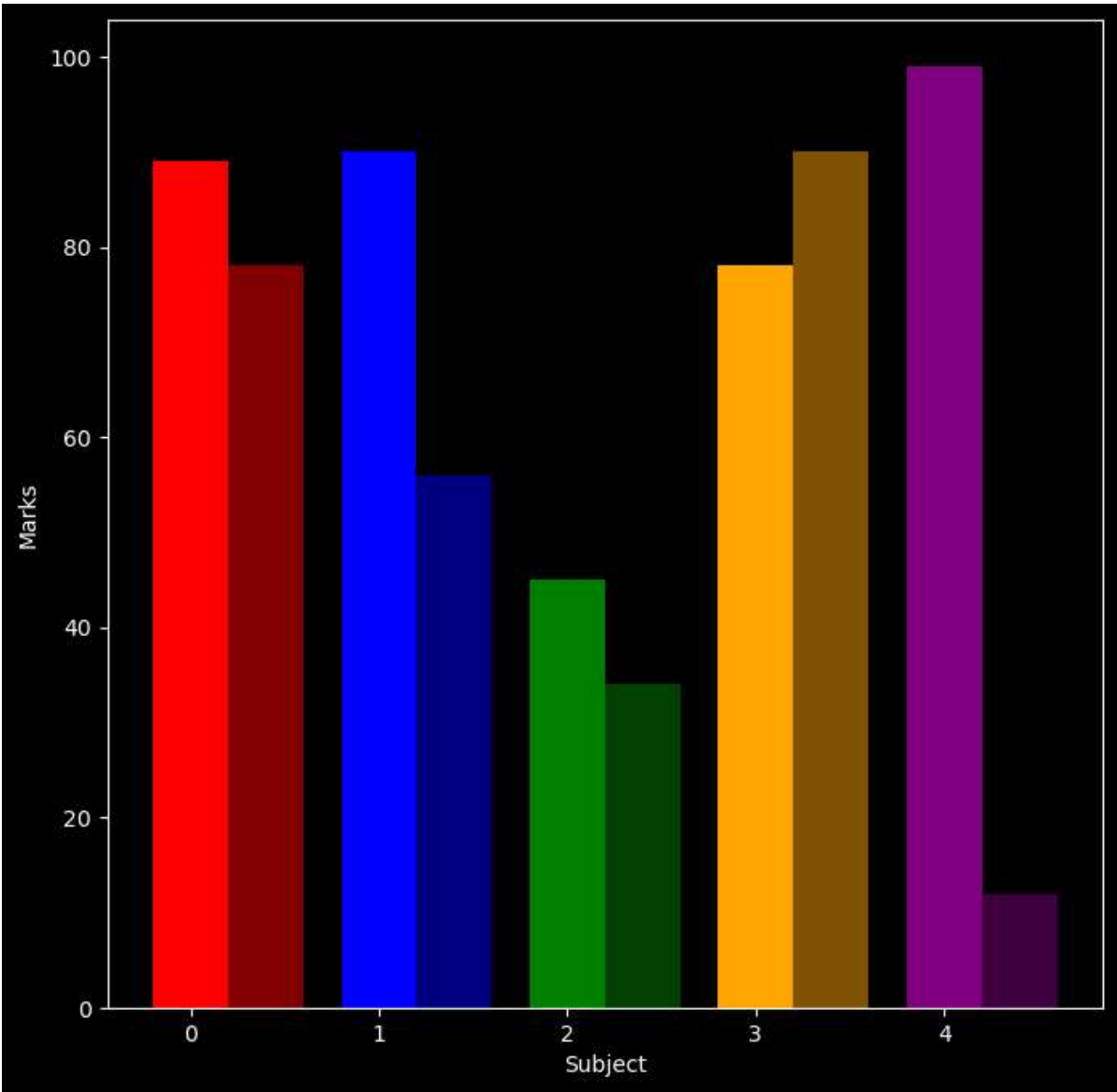|	Invoice ID	Branch	City	Customer type	Gender	Product line	Unit price	Quantity	Tax 5%	Total
0	750-67-8428	A	Yangon	Member	Female	Health and beauty	74.69	7	26.1415	548.9715
1	226-31-3081	C	Naypyitaw	Normal	Female	Electronic accessories	15.28	5	3.8200	80.2200
2	631-41-3108	A	Yangon	Normal	Male	Home and lifestyle	46.33	7	16.2155	340.5255
3	123-19-1176	A	Yangon	Member	Male	Health and beauty	58.22	8	23.2880	489.0480
4	373-73-7910	A	Yangon	Normal	Male	Sports and travel	86.31	7	30.2085	634.3785

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In [233…
```python
payment_df = pd.DataFrame(df['Payment'].value_counts())
payment_df
```

Out[233]:

	Payment
Ewallet	345
Cash	344
Credit card	311

In [234…
```python
colors = ['red', 'blue', 'green']
plt.bar(payment_df.index, payment_df['Payment'], color = colors)
plt.show()
```
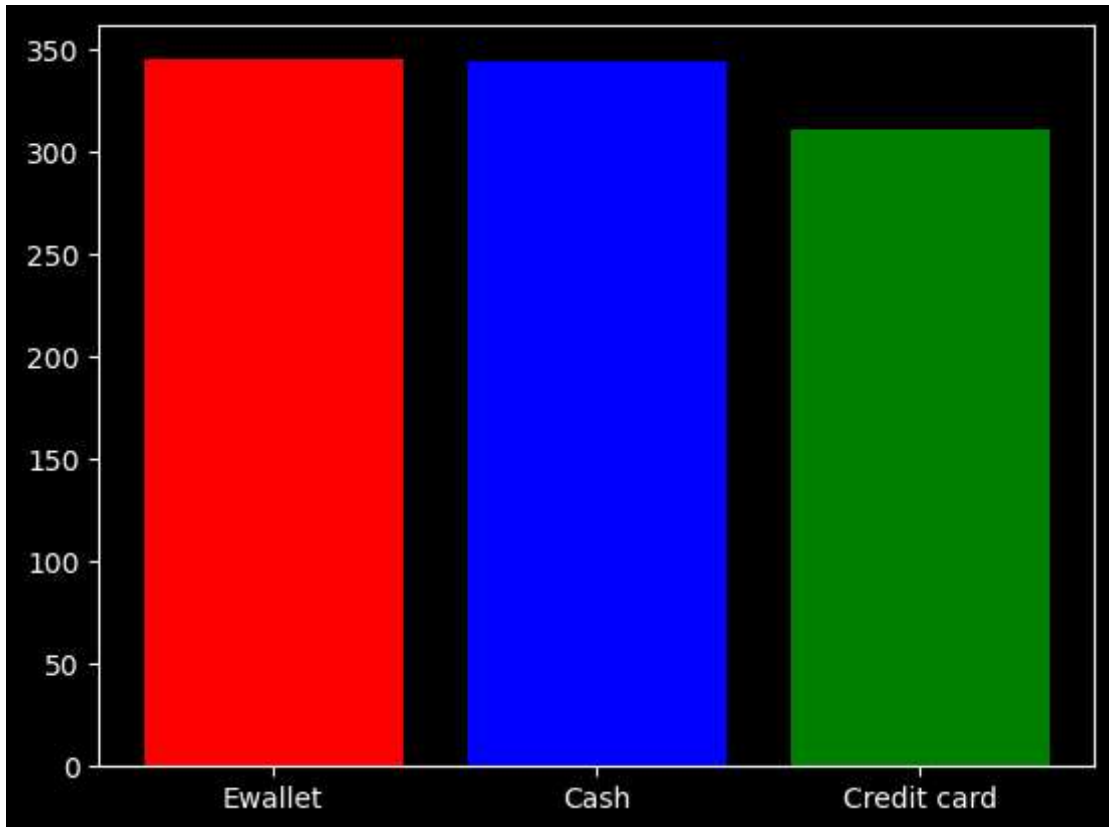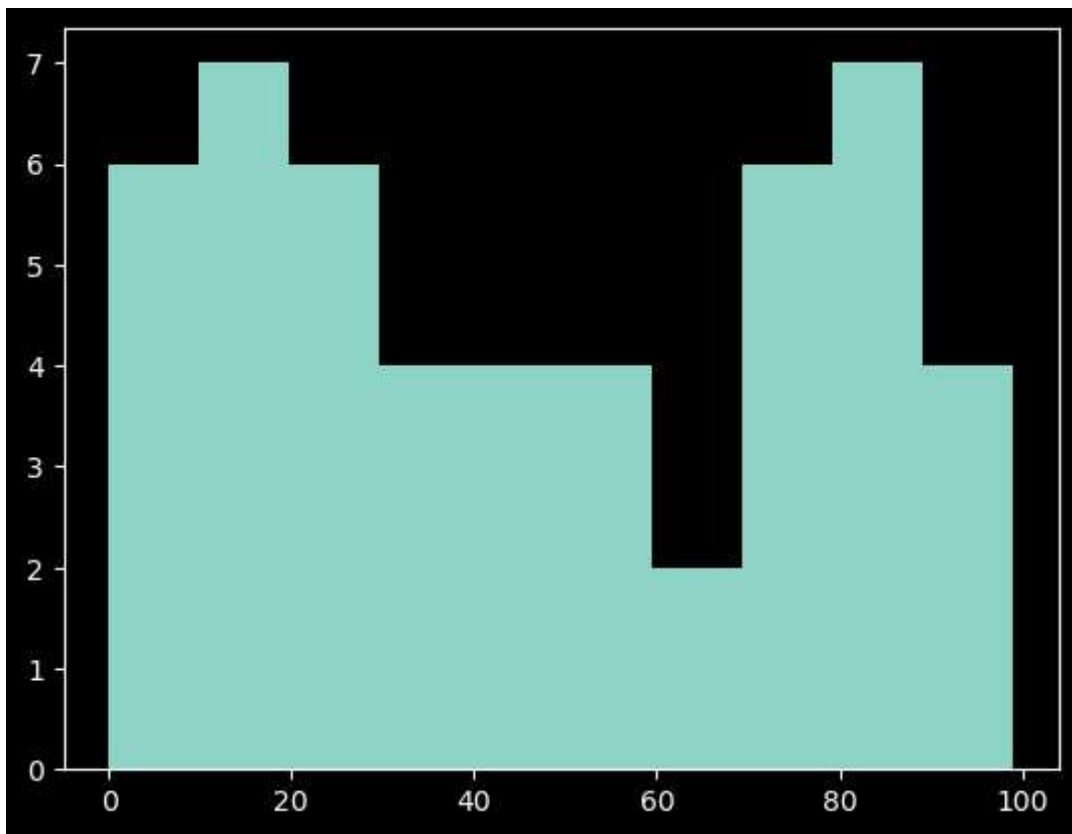

In [235…
```python
marks = np.random.randint(0,100,(50))
marks
```
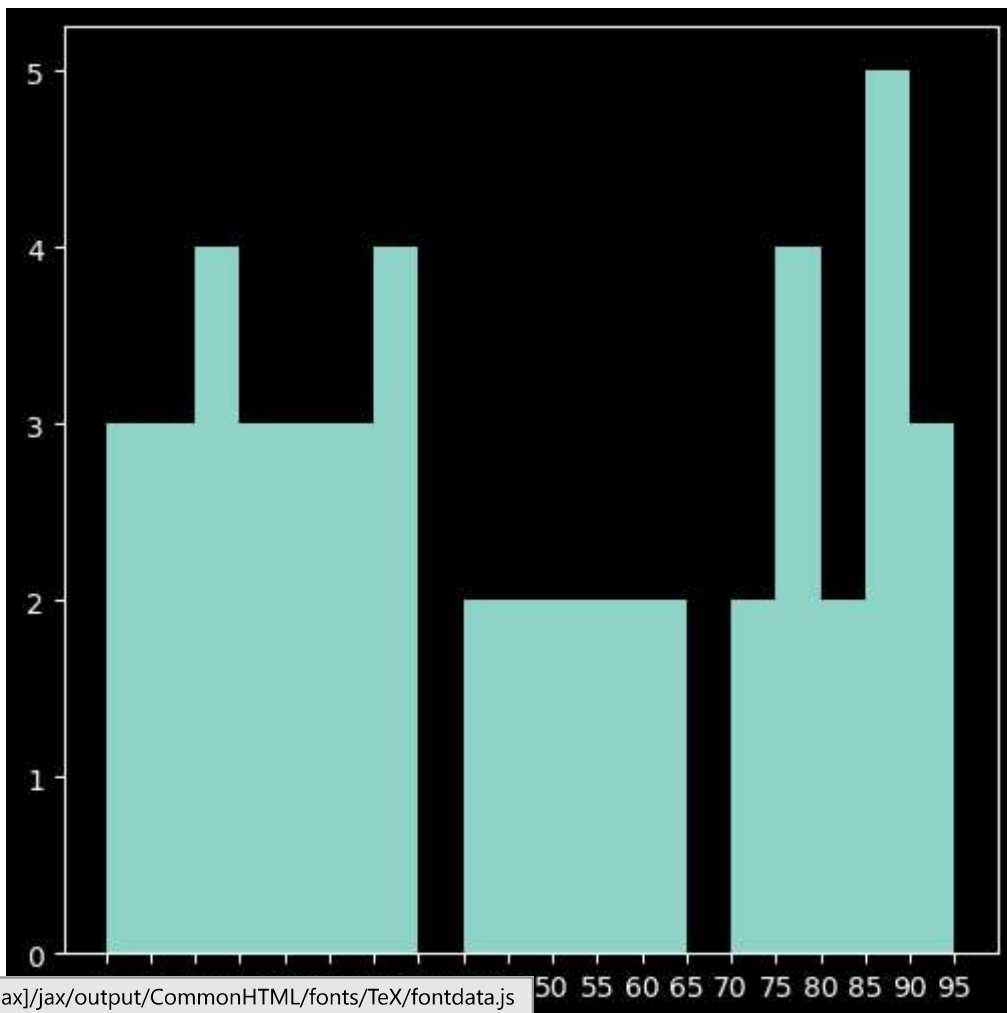
Out[235]:
```
array([31, 53, 78, 49, 49, 10, 28, 27, 81, 89, 58, 94, 87, 10, 34, 10, 62,
       18, 76, 57,  6, 11, 79, 34, 99, 88, 51,  0, 80,  6, 24, 25, 63, 21,
        9, 23,  4, 87, 43,  3, 34, 17, 74, 78, 43, 19, 87, 70, 94, 91])
```

In [236…
```python
plt.hist(marks)
plt.show()
```

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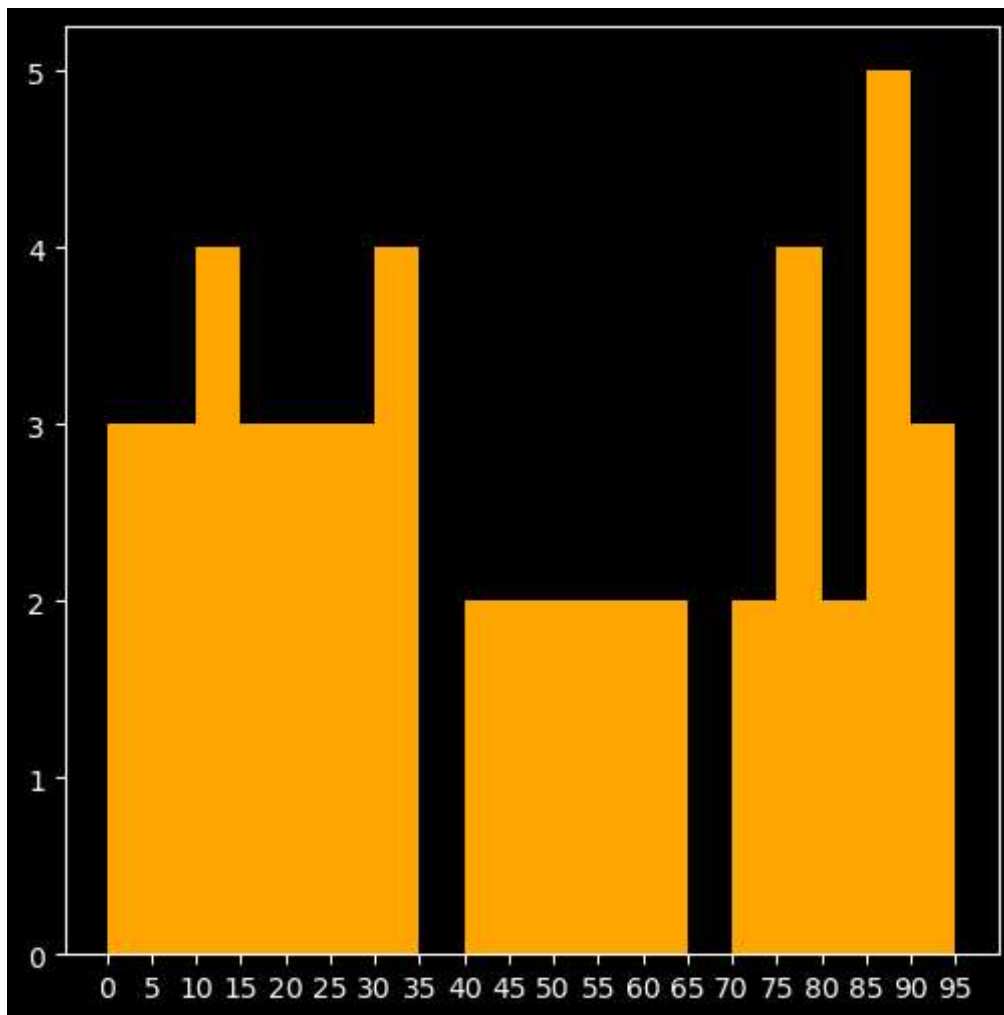
```
In [237…   bins = np.arange(0,100,5)
           plt.figure(figsize=(6,6))
           plt.hist(marks, bins = bins)
           plt.xticks(np.arange(0,100,5))
           plt.show()
```


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In [238…
```python
bins = np.arange(0,100,5)
plt.figure(figsize=(6,6))
plt.hist(marks, bins = bins, color = 'orange')
plt.xticks(np.arange(0,100,5))
plt.show()
```


In [239…
```python
bins = np.arange(0,100,5)
plt.figure(figsize=(6,6))
plt.hist(marks, bins = bins, color = 'orange', orientation = 'horizontal')
plt.yticks(np.arange(0,100,5))
plt.show()
```
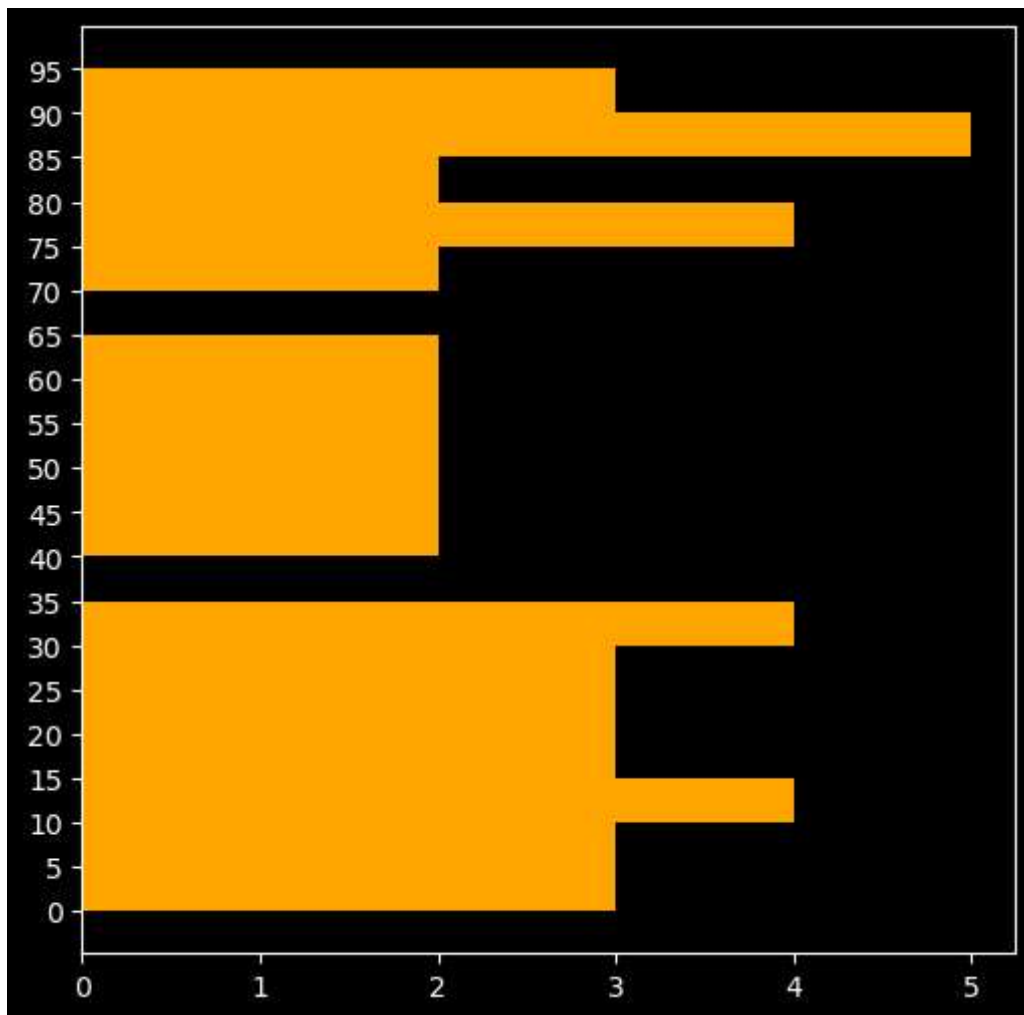
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```
In [240...   bins = np.arange(0,100,5)
            plt.figure(figsize=(6,6))
            plt.hist(marks, bins = bins, color = 'orange', rwidth = 0.6)
            plt.xticks(np.arange(0,100,5))
            plt.show()
```
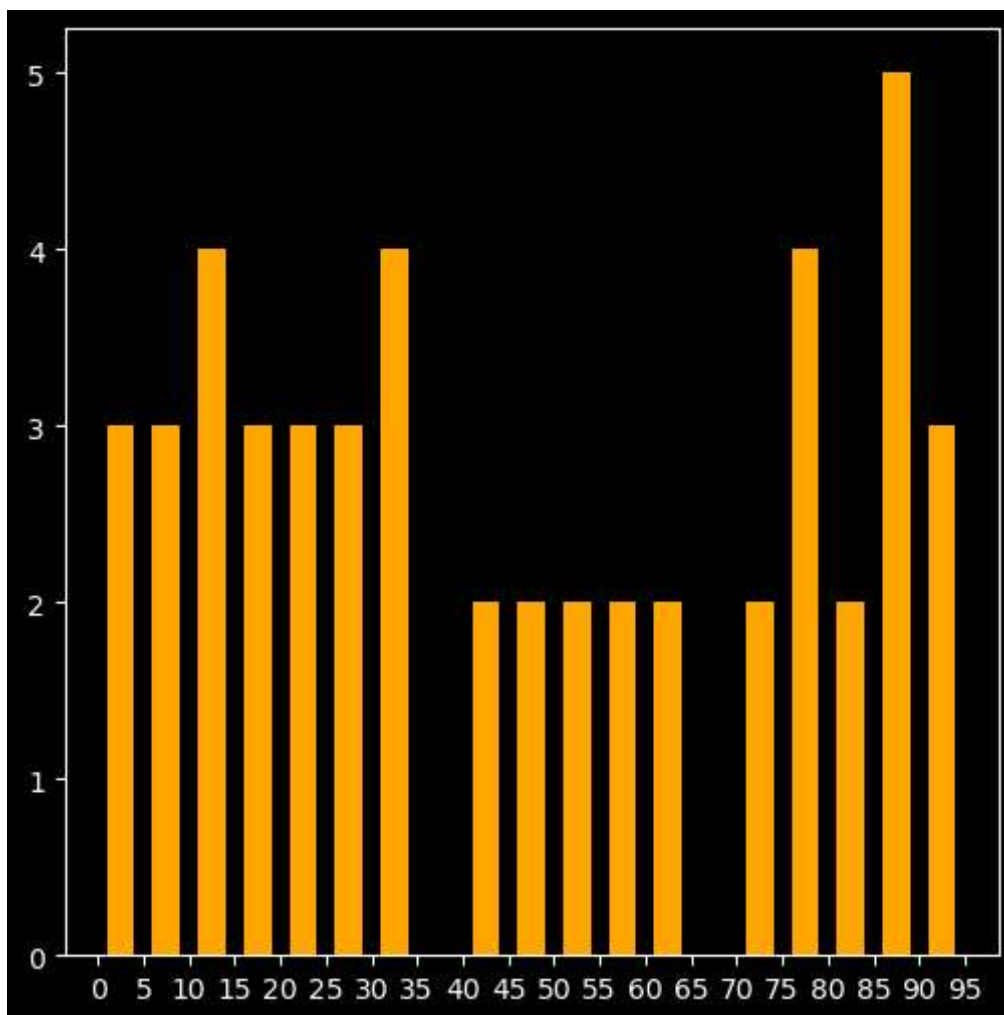
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```python
bins = np.arange(0,100,5)
plt.figure(figsize=(6,6))
plt.hist(marks, bins = bins, color = 'orange', histtype = 'step')
plt.xticks(np.arange(0,100,5))
plt.show()
```
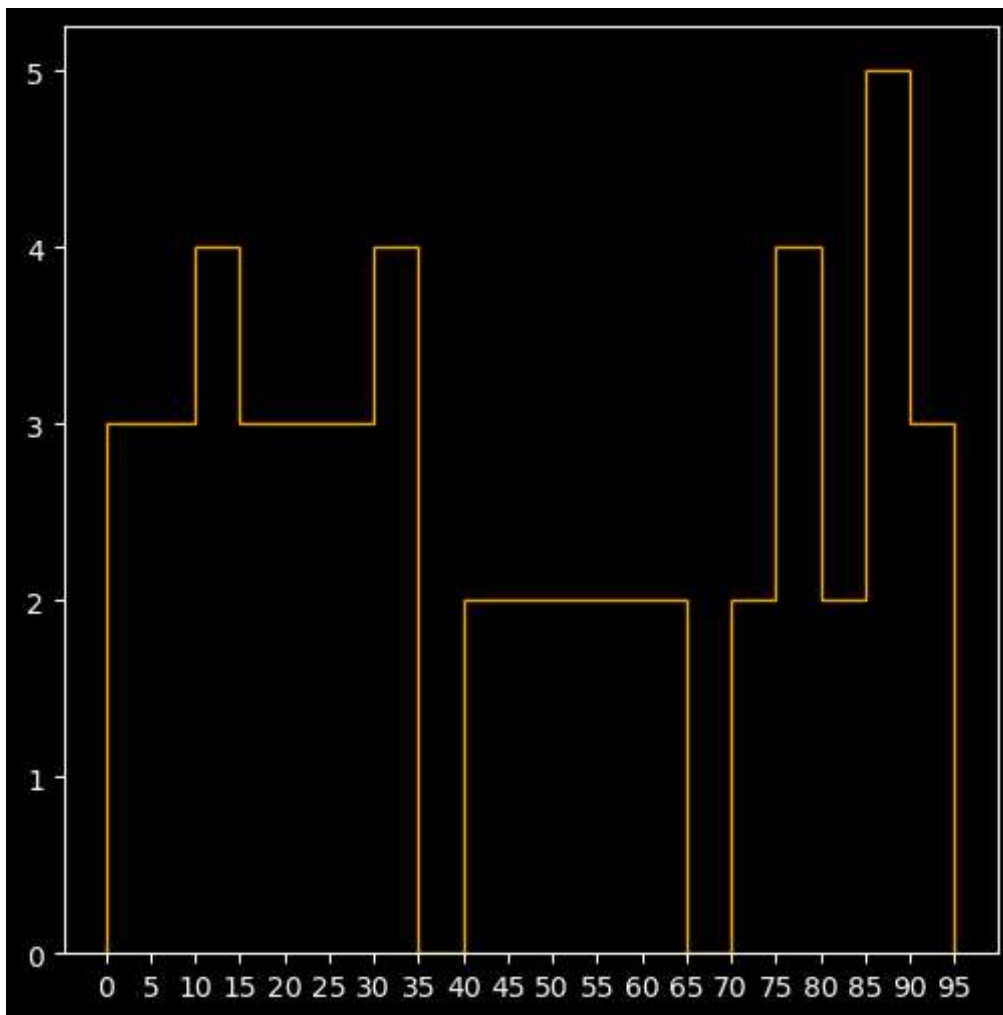
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```python
marks_50_students1 = np.random.randint(0, 100, (50))
marks_50_students2 = np.random.randint(0, 100, (50))
```

```python
bins = np.arange(0,100,5)

plt.figure(figsize=(6,6))

plt.hist([marks_50_students1, marks_50_students2], bins = bins, color = ['orange',

plt.xlabel("Marks")
plt.ylabel("Frequency")
plt.title("Marks of students of 2 classes")
plt.show()
```
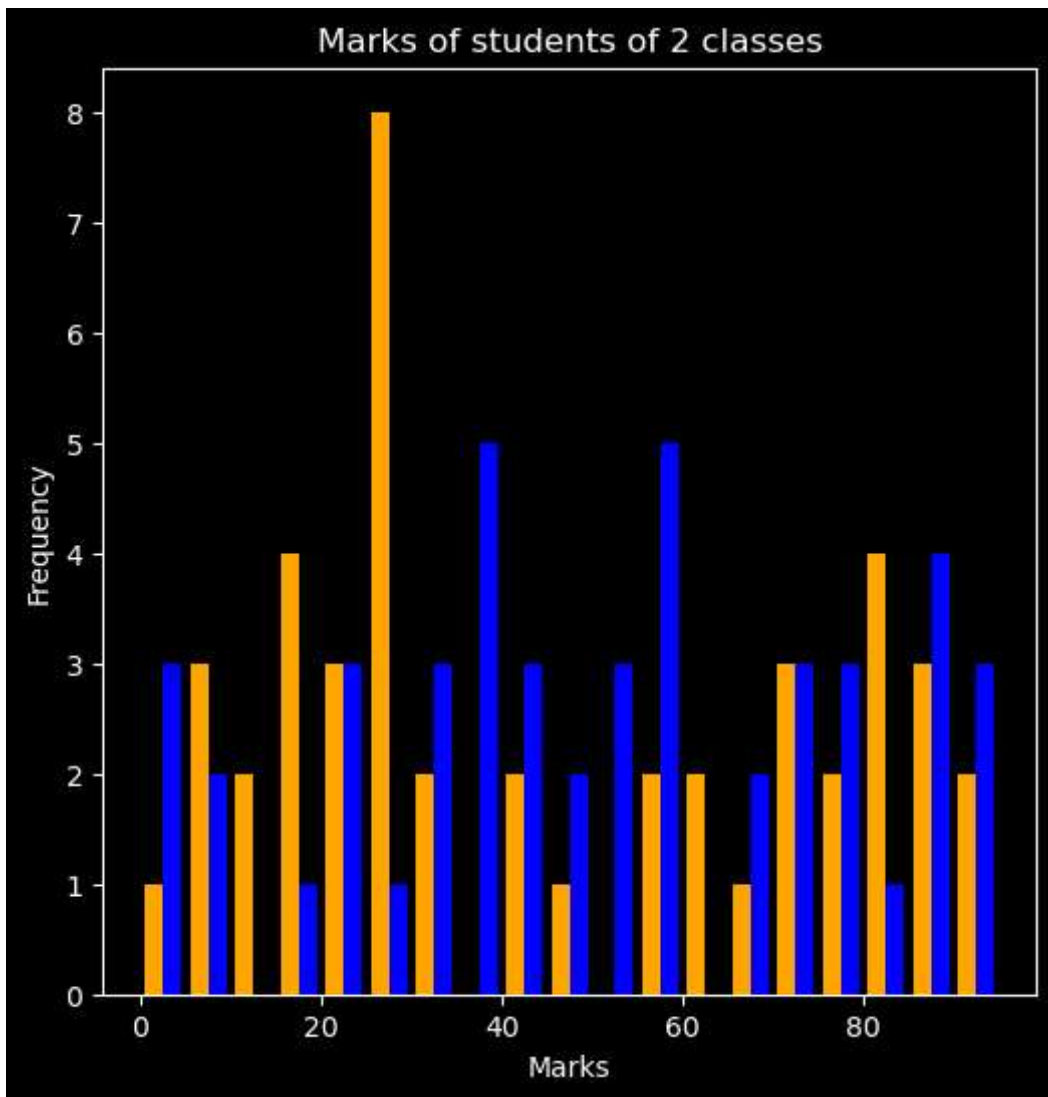
```
In [244…    classes = ['Physics', 'Chemistry', 'Maths', 'Science', 'SST']
            marks = [89, 45, 78, 23, 90]
```

```
In [245…    plt.pie(marks, labels = classes)
            plt.show()
```

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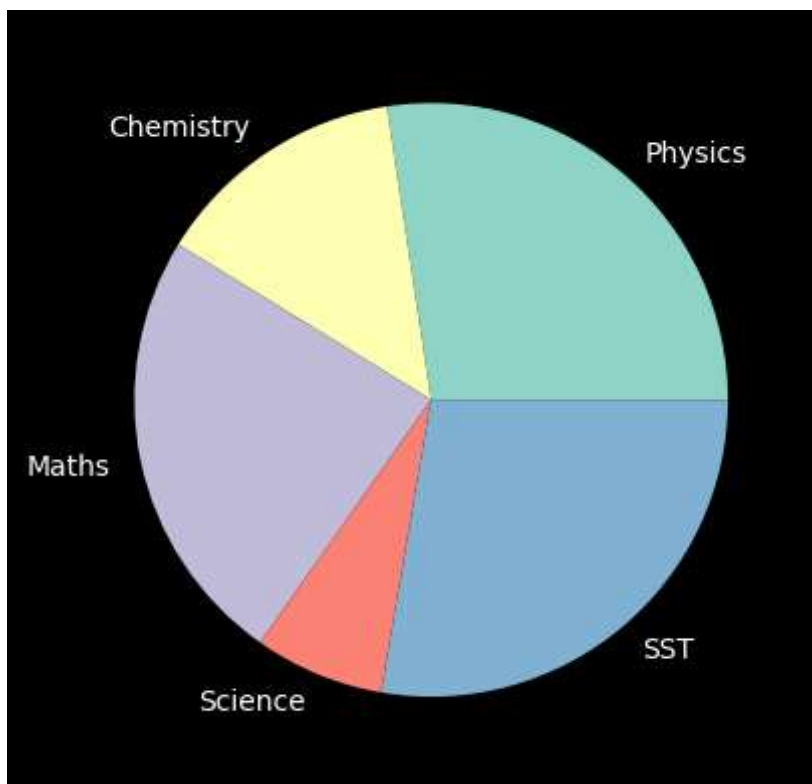
```
In [246...   colors = ['red', 'blue', 'green', '#9803fc', '#03c2fc']

             plt.pie(marks, labels = classes, colors=colors)
             plt.show()
```
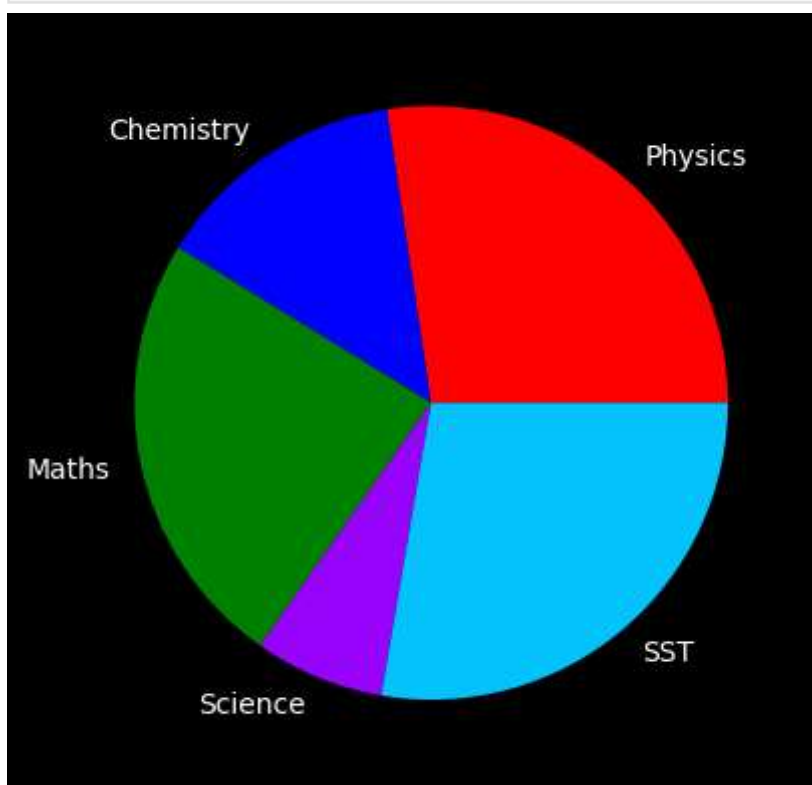


```
In [247...   plt.pie(marks, labels = classes, colors=colors, autopct = '%0.1f%%')
             plt.show()
```
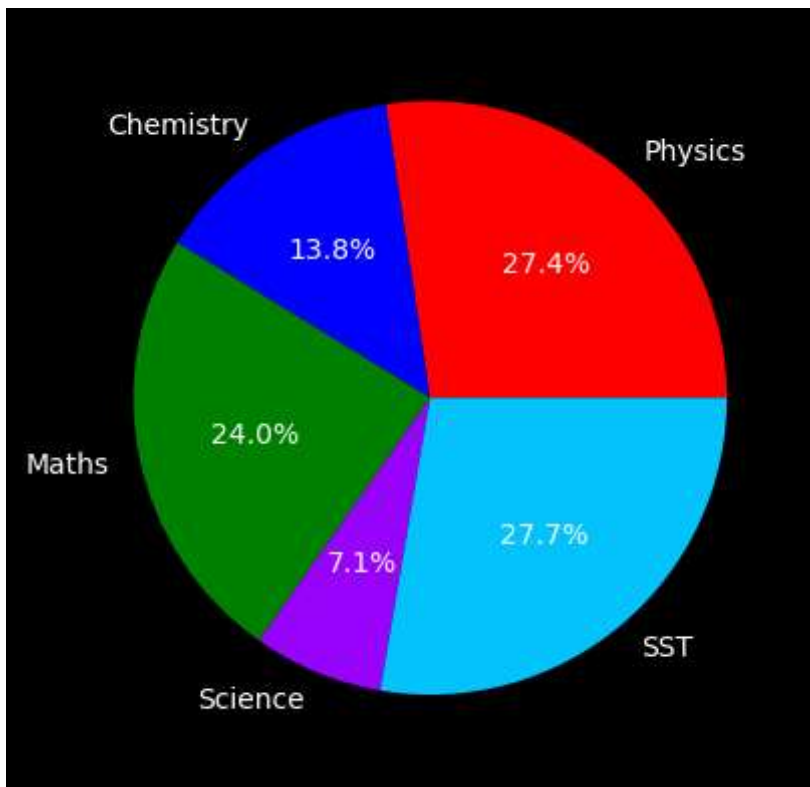
```
In [248…   explode_values = [0.1,0.2,0,0,0]
           plt.pie(marks, labels = classes, colors = colors, autopct = '%0.1f%%', explode = e
           plt.show()
```
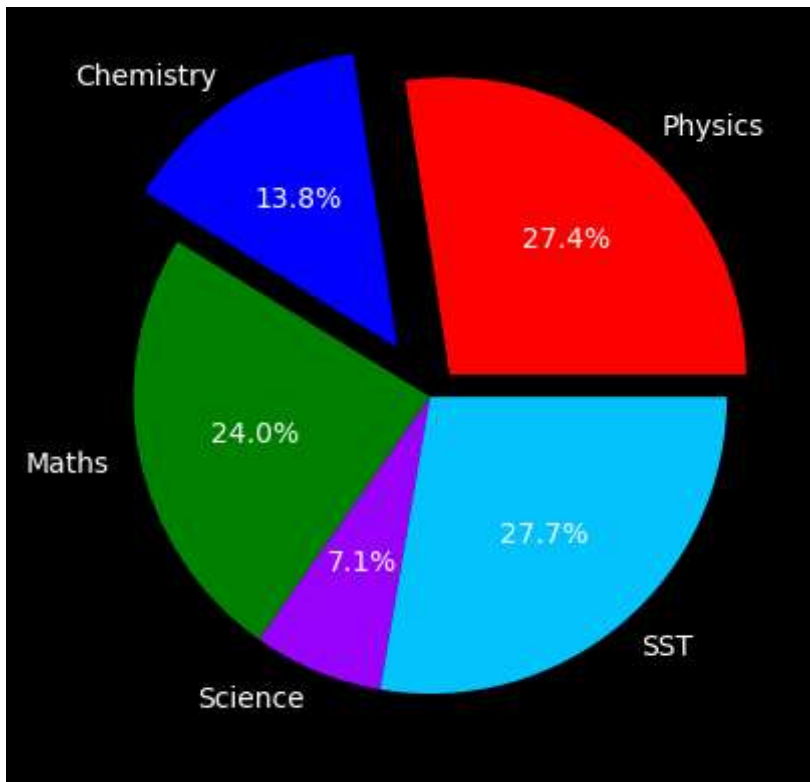


```
In [249…   plt.pie(marks, labels = classes, colors = colors, autopct = '%0.1f%%', explode = e
           plt.show()
```

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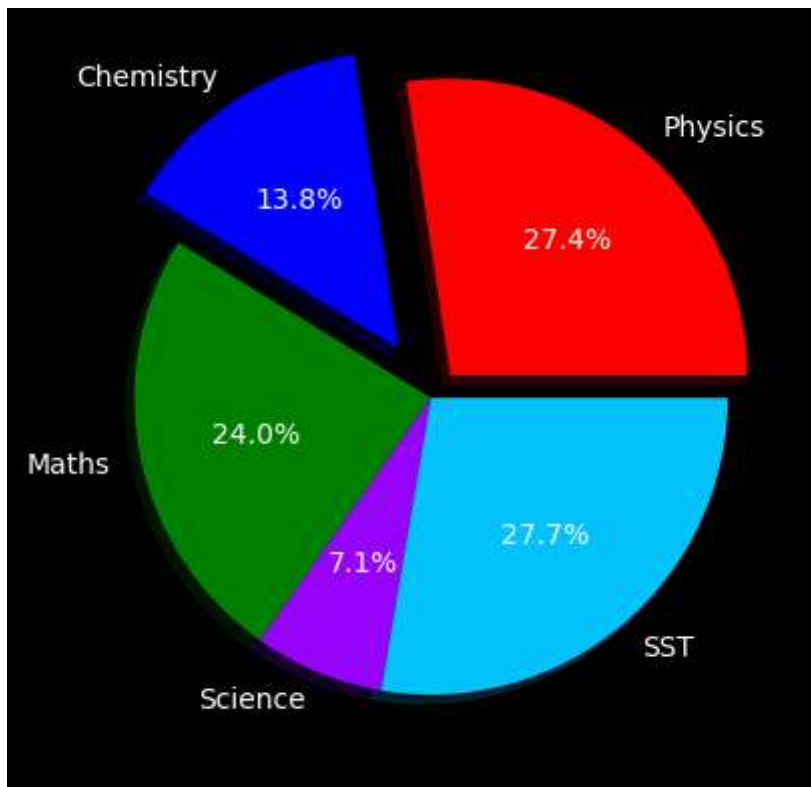
```
In [250…   plt.pie(marks, labels = classes, colors = colors, autopct = '%0.1f%%', explode = e
           plt.show()
```
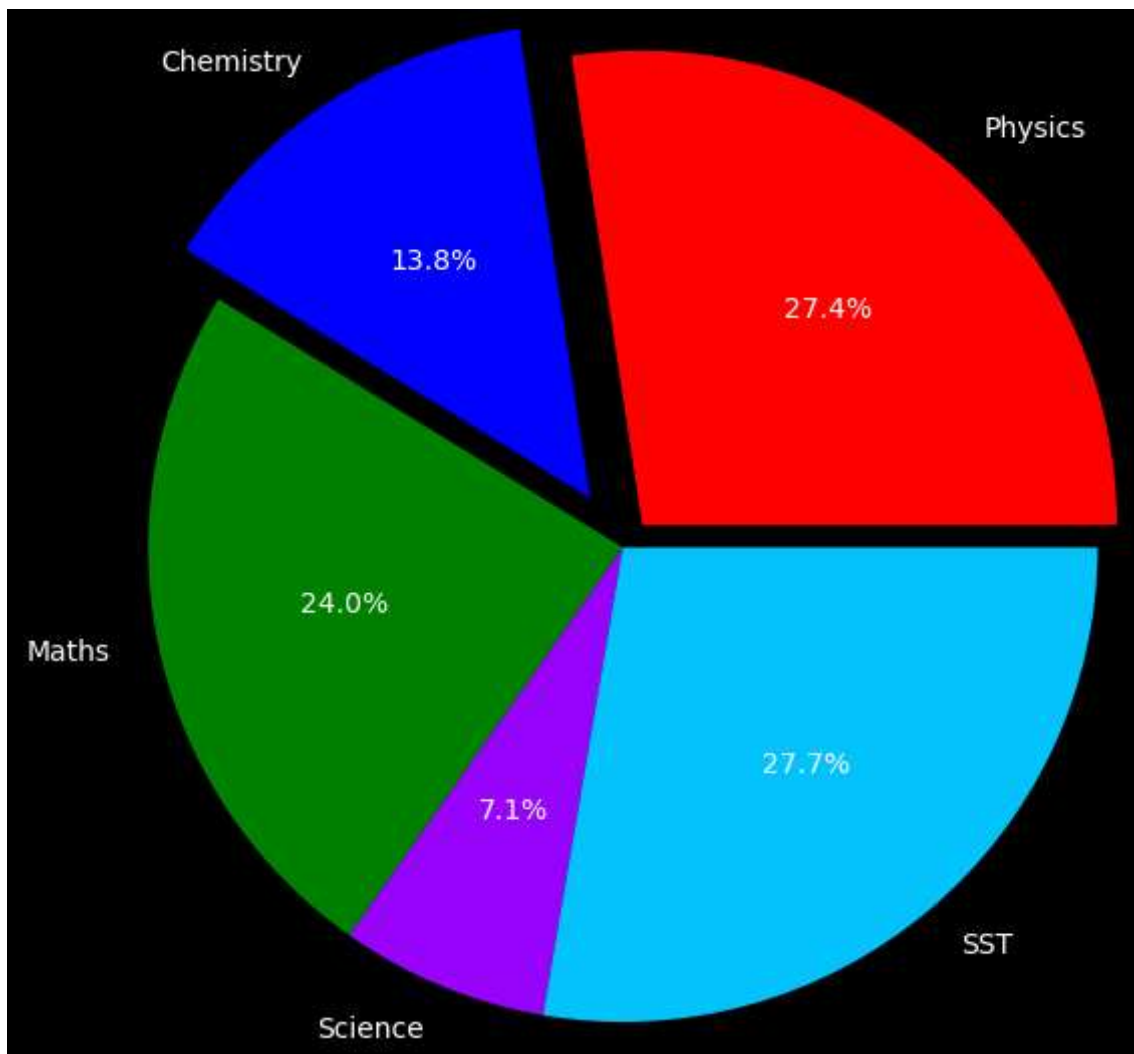


```
In [251    textprops = {'fontsize':14, 'color':'k'}
```

Loading [MathJax]/jax/output/CommonHTML/fonts/TeX/fontdata.js ors = colors, autopct = '%0.1f%%', explode = e

```
plt.show()
```
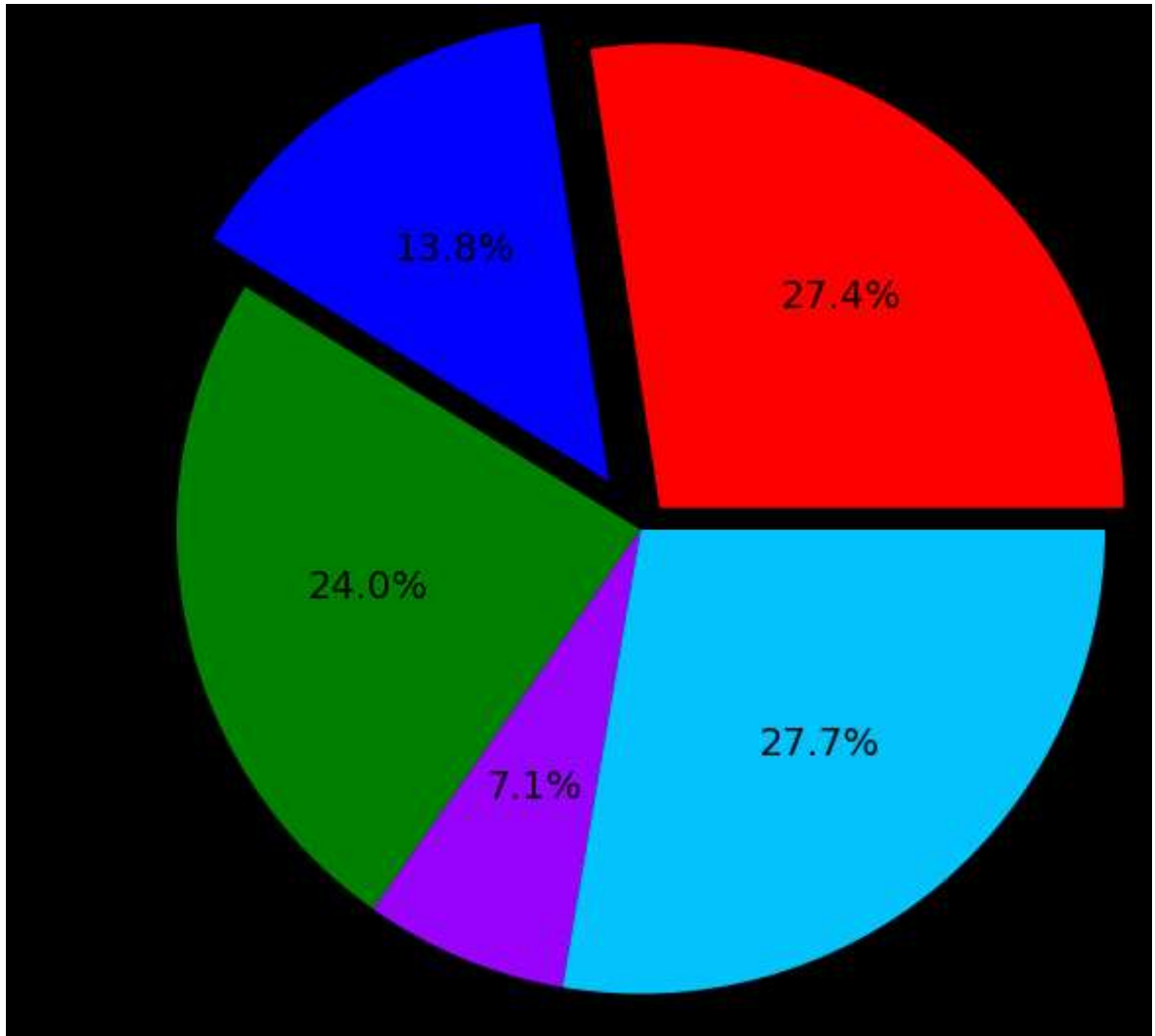


```
In [252…    textprops = {'fontsize':14, 'color':'k'}
            wedgeprops = {'linewidth':2, 'linestyle':'--', 'edgecolor':'white'}
            plt.pie(marks, labels = classes, colors = colors, autopct = '%0.1f%%', explode = e
                    textprops = textprops,
                    wedgeprops = wedgeprops)
            plt.show()
```

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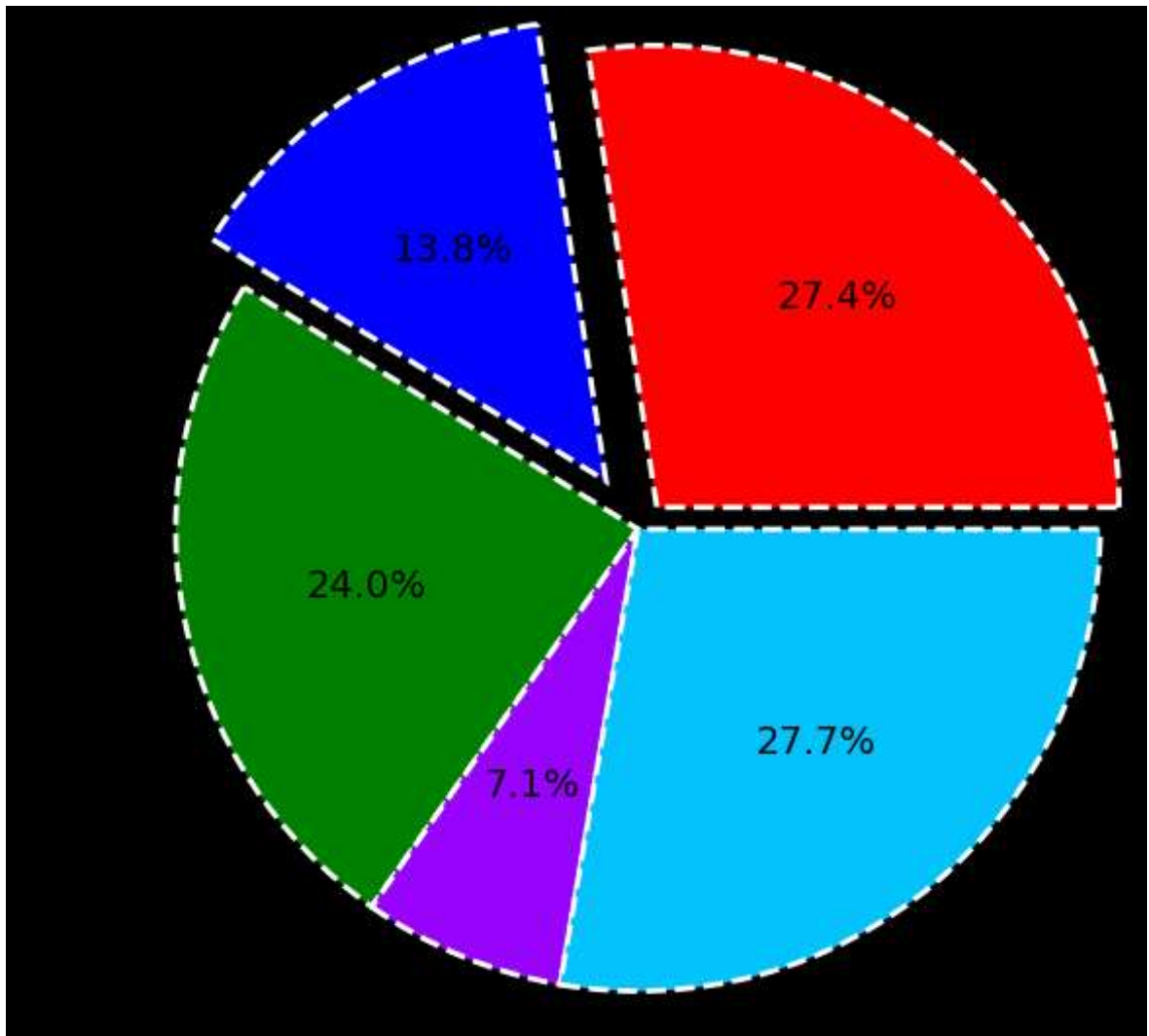
```
In [253...   plt.figure(figsize=(6,6))
             plt.pie(marks, labels = classes, colors = colors, autopct = '%0.1f%%', explode = e
                     textprops = textprops)
             plt.title("Subjects and Average Scores")
             plt.legend()
             plt.show()
```

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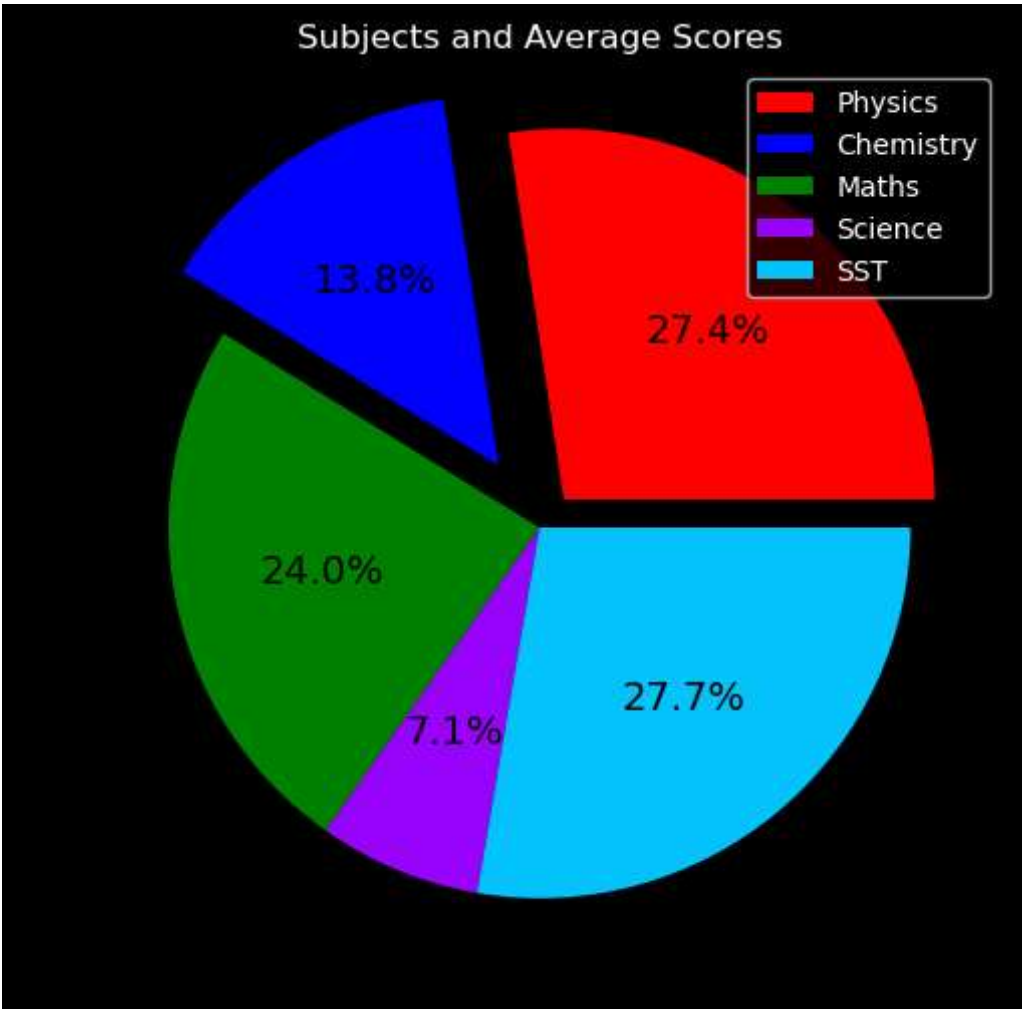
In [254... `df = pd.read_csv(r'C:\Users\harsh\Desktop\Python - Data Analysis\Matplotlib\SUPERM/`
`df.head()`

Out[254]:

	Invoice ID	Branch	City	Customer type	Gender	Product line	Unit price	Quantity	Tax 5%	Total
0	750-67-8428	A	Yangon	Member	Female	Health and beauty	74.69	7	26.1415	548.9715
1	226-31-3081	C	Naypyitaw	Normal	Female	Electronic accessories	15.28	5	3.8200	80.2200
2	631-41-3108	A	Yangon	Normal	Male	Home and lifestyle	46.33	7	16.2155	340.5255
3	123-19-1176	A	Yangon	Member	Male	Health and beauty	58.22	8	23.2880	489.0480
4	373-73-7910	A	Yangon	Normal	Male	Sports and travel	86.31	7	30.2085	634.3785

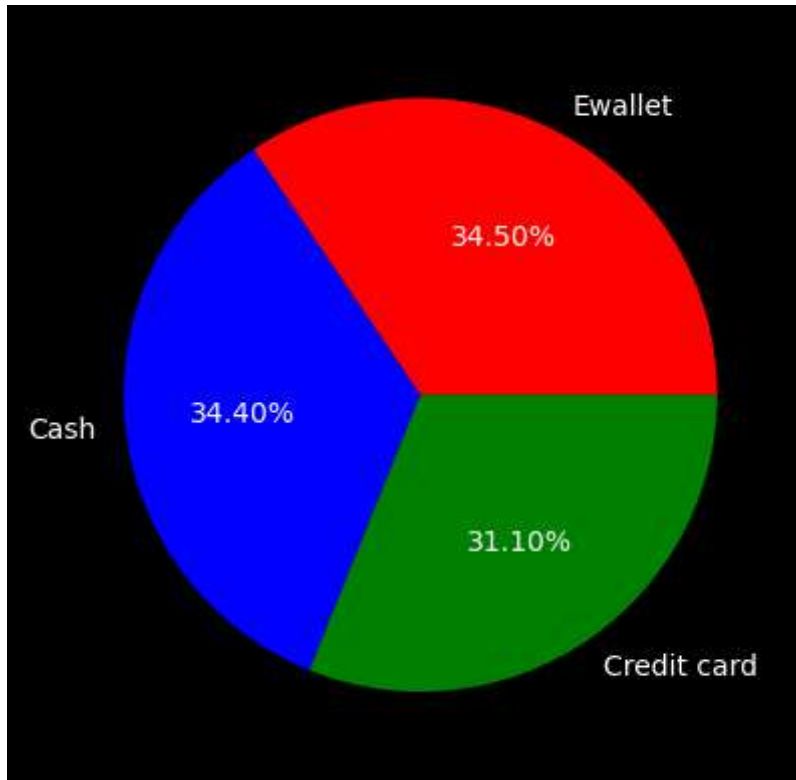In [255... `payment_df = pd.DataFrame(df['Payment'].value_counts())`
`payment_df`

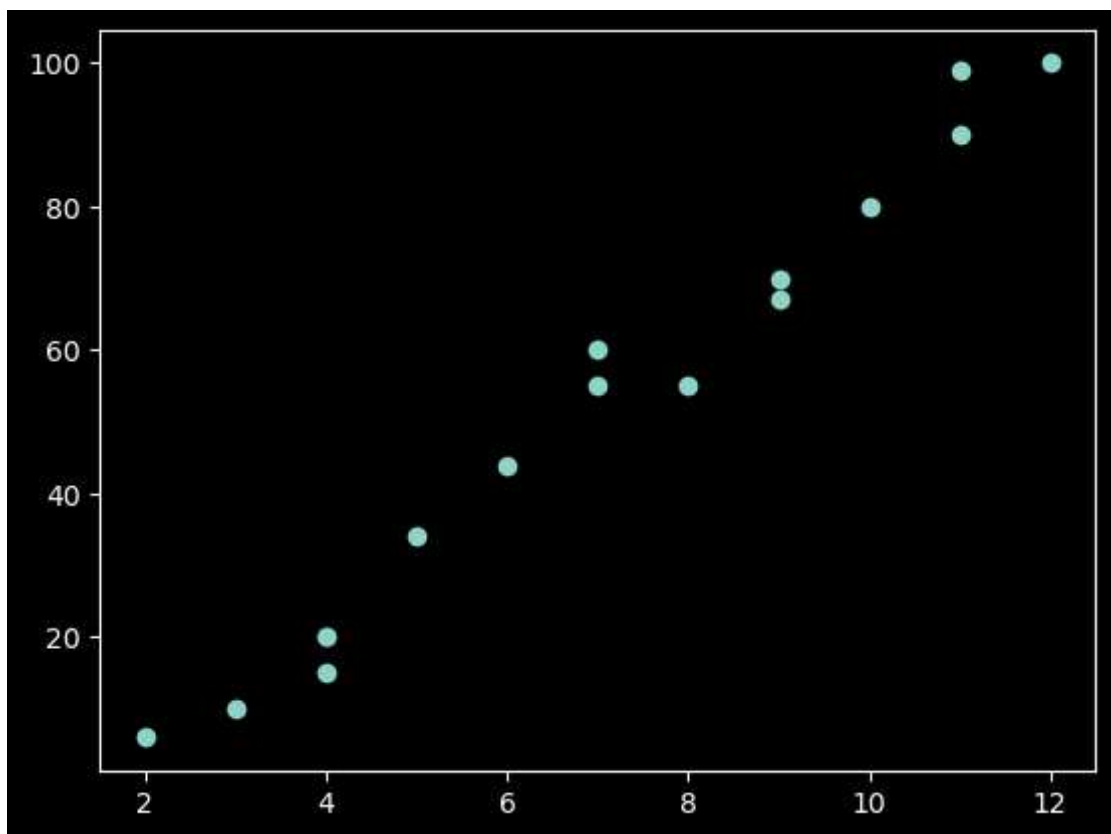Loading [MathJax]/jax/output/CommonHTML/fonts/TeX/fontdata.js

Out[255]:

	Payment
Ewallet	345
Cash	344
Credit card	311

In [256…

```python
plt.pie(payment_df['Payment'], labels = payment_df.index,
        colors=['red', 'blue', 'green'],
        autopct = '%0.2f%%')
plt.show()
```
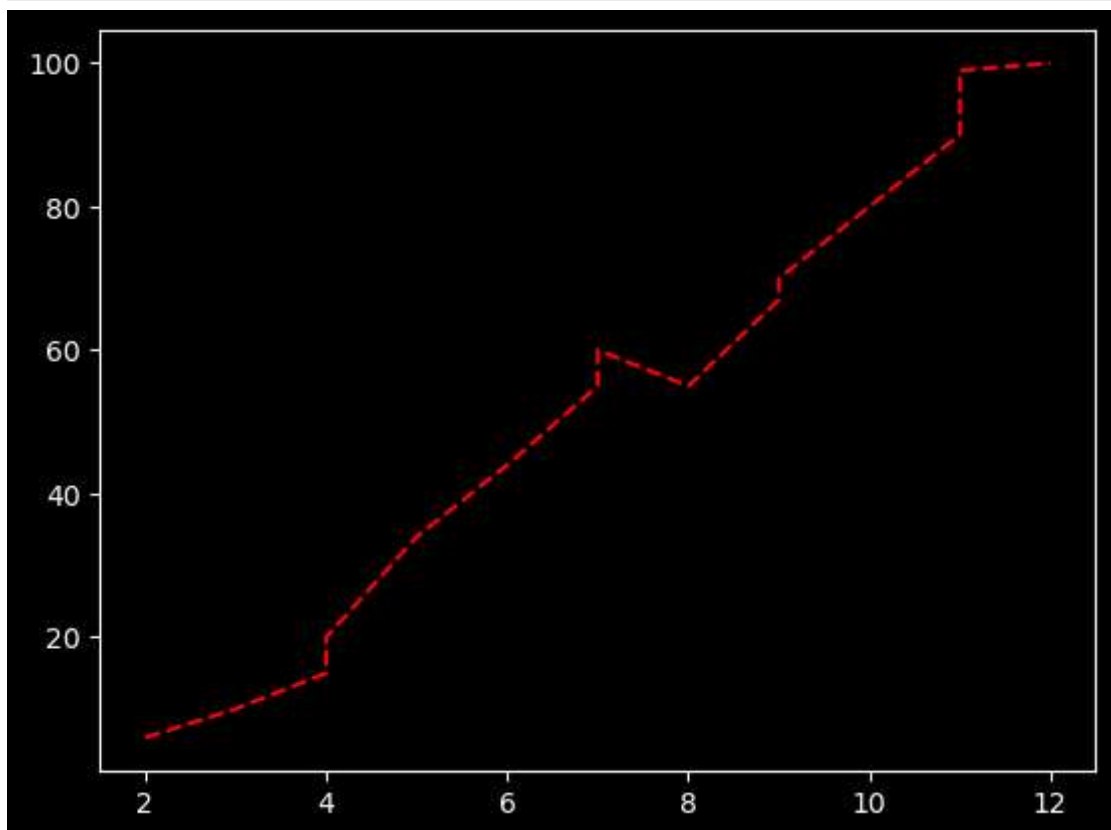

In [257…

```python
study_hours = [2,3,4,4, 5, 6, 7, 7, 8, 9, 9, 10, 11, 11, 12]
marks = [6, 10, 15, 20, 34, 44, 55, 60, 55, 67, 70, 80, 90, 99, 100]
```

In [258…

```python
plt.scatter(study_hours, marks)
plt.show()
```

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In [259…
```python
plt.plot(study_hours, marks, 'r--')
plt.show()
```


In [260…
```python
plt.hist(marks)
plt.show()
```

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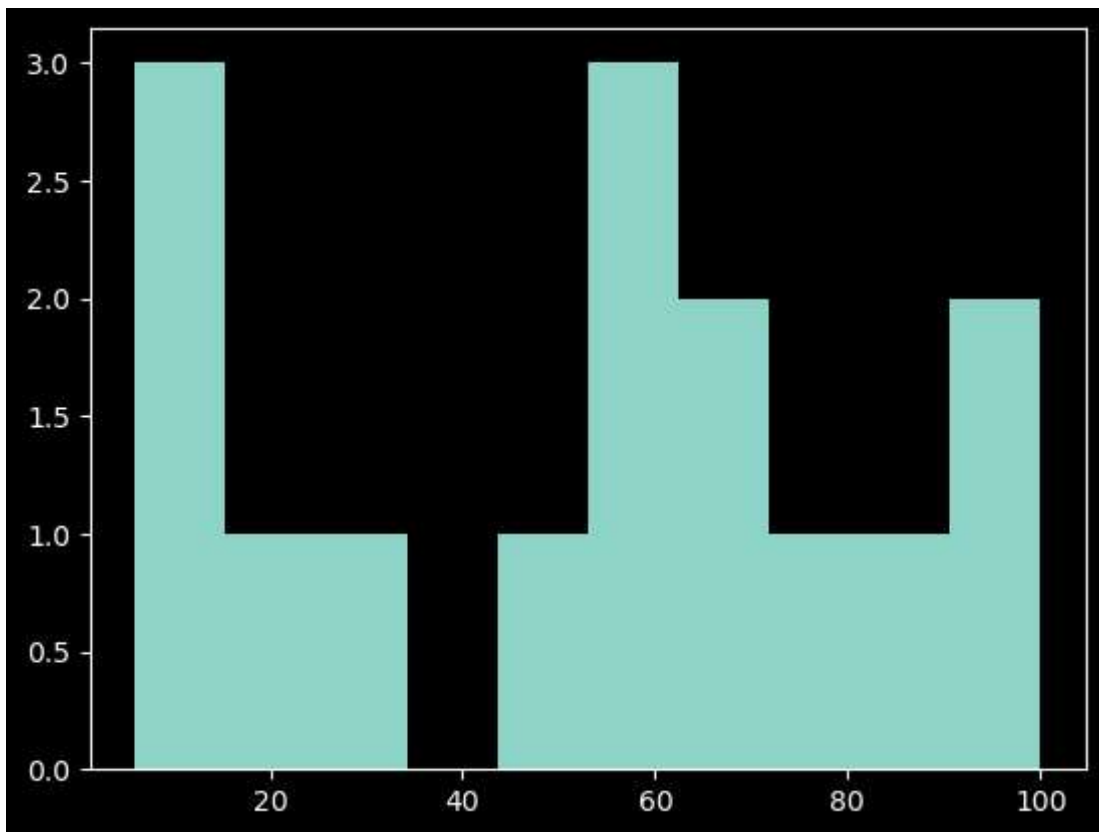
In [261…
```python
plt.figure(figsize=(6,6))
plt.plot(study_hours, marks, 'r--')
plt.plot(study_hours, marks, 'bo')
plt.show()
```
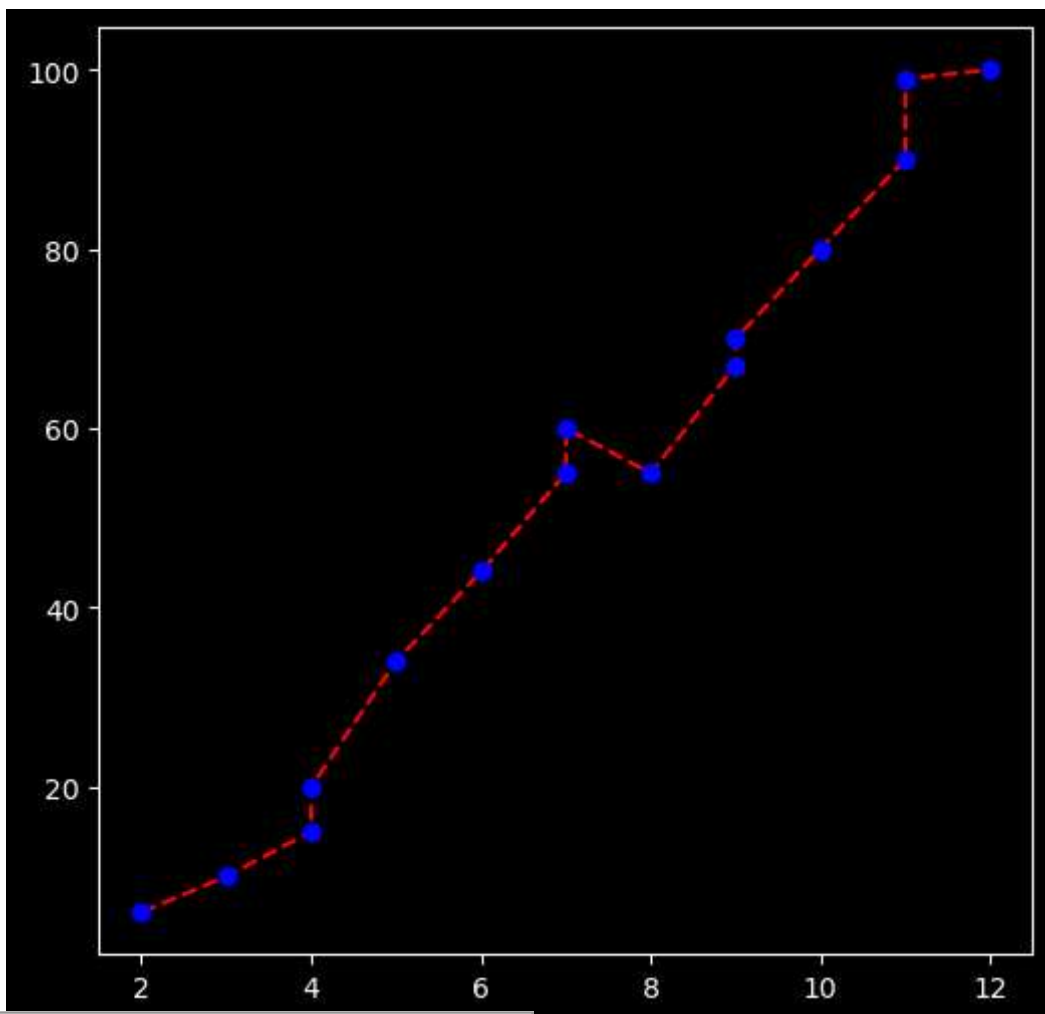

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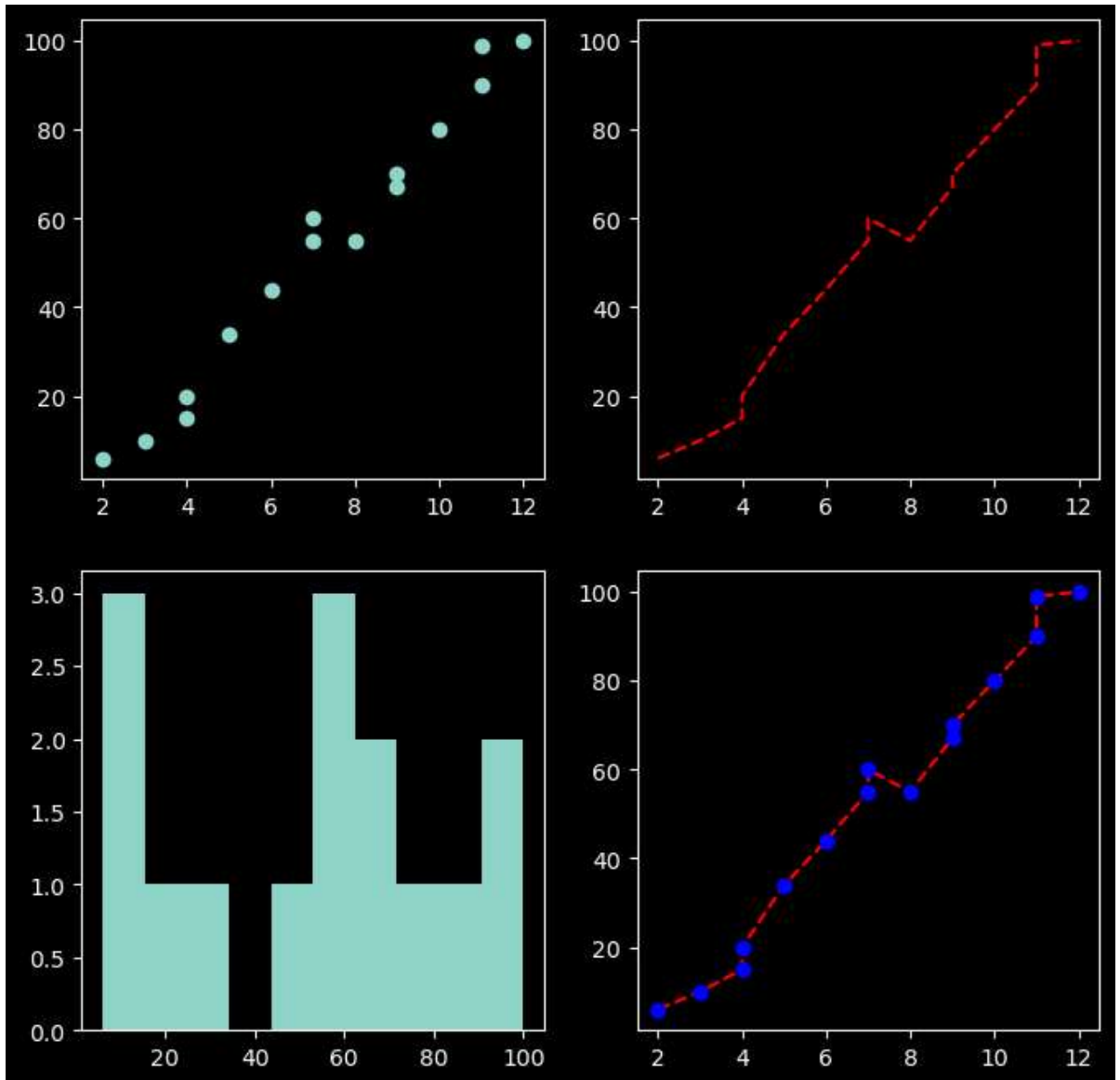
```
In [262...  plt.figure(figsize=(8,8))

            plt.subplot(2,2,1)      #(rows, columns, index number)
            plt.scatter(study_hours, marks)

            plt.subplot(2,2,2)
            plt.plot(study_hours, marks, 'r--')

            plt.subplot(2,2,3)
            plt.hist(marks)

            plt.subplot(2,2,4)
            plt.plot(study_hours, marks, 'r--')
            plt.plot(study_hours, marks, 'bo')
            plt.show()
```



```
In [263...  import matplotlib.image as mpimg
```

```
In [264...  img = mpimg.imread(r'C:\Users\harsh\Desktop\Python - Data Analysis\Matplotlib\image
```

```
In [265...  plt.imshow(img)
            plt.show()
```

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```
In [266…   plt.imshow(img, aspect = 0.5)
           plt.show()
```



```
In [267…   img1 = mpimg.imread(r'C:\Users\harsh\Desktop\Python - Data Analysis\Matplotlib\imag
           img2 = mpimg.imread(r'C:\Users\harsh\Desktop\Python - Data Analysis\Matplotlib\istα
           img3 = mpimg.imread(r'C:\Users\harsh\Desktop\Python - Data Analysis\Matplotlib\phoτ
           img4 = mpimg.imread(r'C:\Users\harsh\Desktop\Python - Data Analysis\Matplotlib\treє
```

```
In [268…   plt.figure()
           plt.subplot(2,2,1)
           plt.imshow(img1)

           plt.subplot(2,2,2)
           plt.imshow(img2)

           plt.subplot(2,2,3)
           plt.imshow(img3)

           plt.subplot(2,2,4)
           plt.imshow(img4)
```
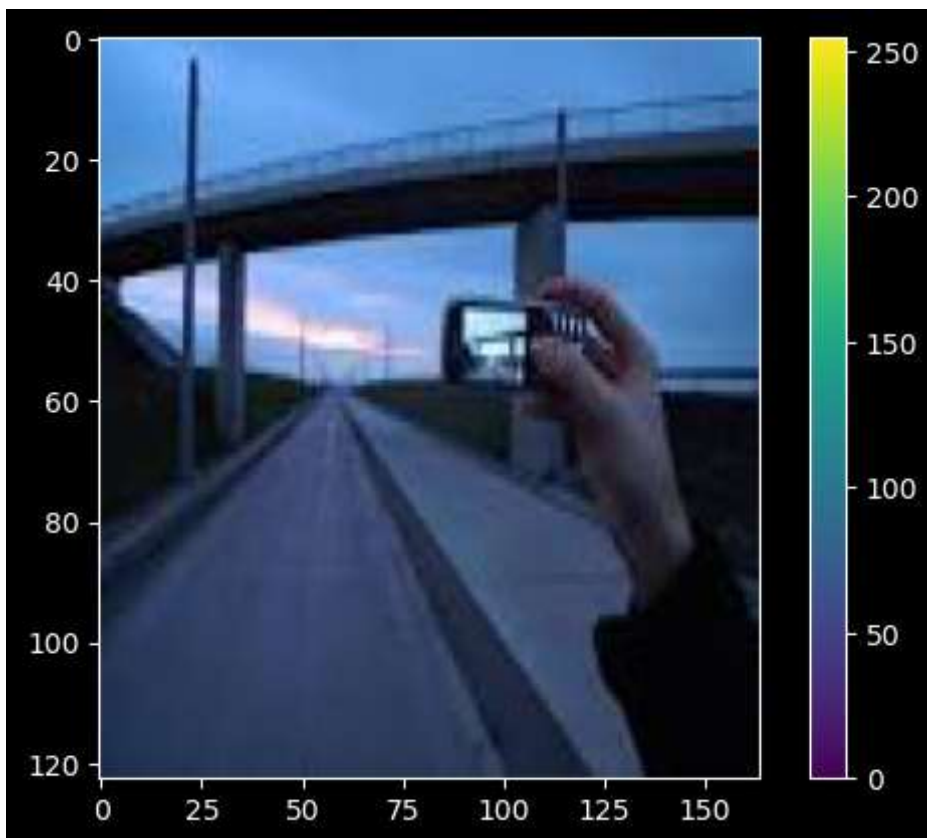
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```
plt.show()
```


In [269…
```
plt.imshow(img, aspect = 1.5)
plt.colorbar()
plt.show()
```


In [270…
```
plt.imshow(img, cmap = 'RdPu')
plt.colorbar()
```

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