

Matplotlib

June 21, 2021

```
[1]: import matplotlib
```

```
[2]: matplotlib.__version__
```

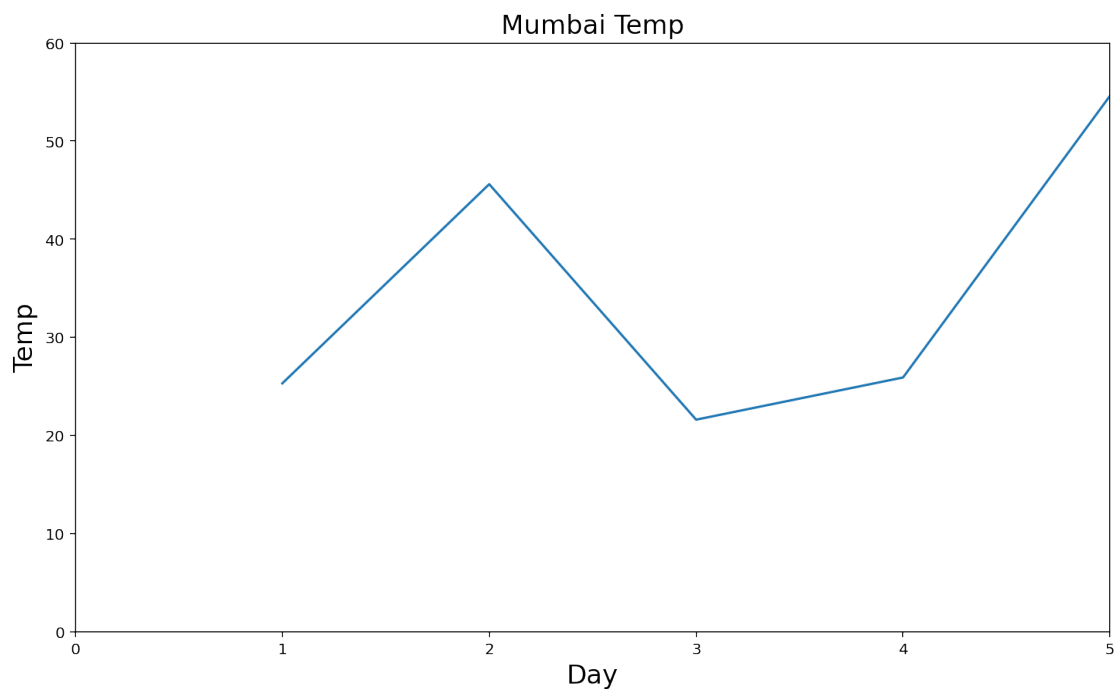
```
[2]: '3.4.2'
```

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

```
[4]: Day = [1,2,3,4,5,6,7]  
Temp = [25.3,45.6,21.6,25.9,54.6,25,65]
```

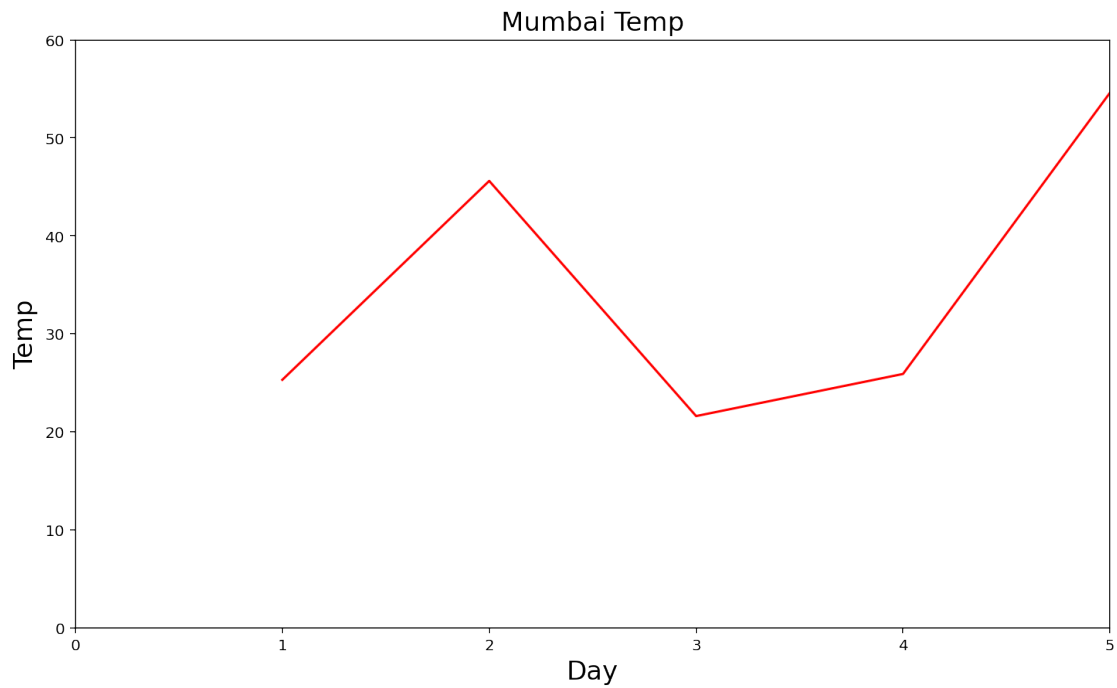
```
[5]: plt.plot(Day,Temp)  
plt.title("Mumbai Temp",fontsize=17)  
plt.axis([0,5,0,60.0])  
plt.xlabel("Day",fontsize=17)  
plt.ylabel("Temp",fontsize=17)  
plt.show()
```

```
[5]:
```



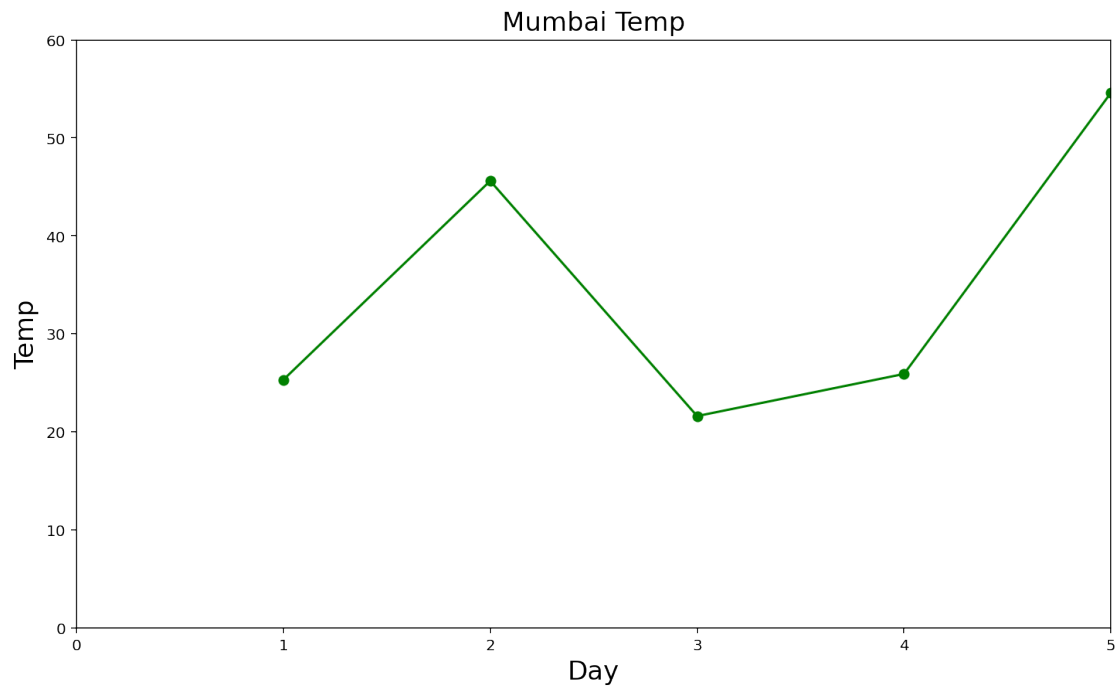
```
[6]: plt.plot(Day,Temp,color='r')
plt.title("Mumbai Temp",fontsize=17)
plt.axis([0,5,0,60.0])
plt.xlabel("Day",fontsize=17)
plt.ylabel("Temp",fontsize=17)
plt.show()
```

[6]:



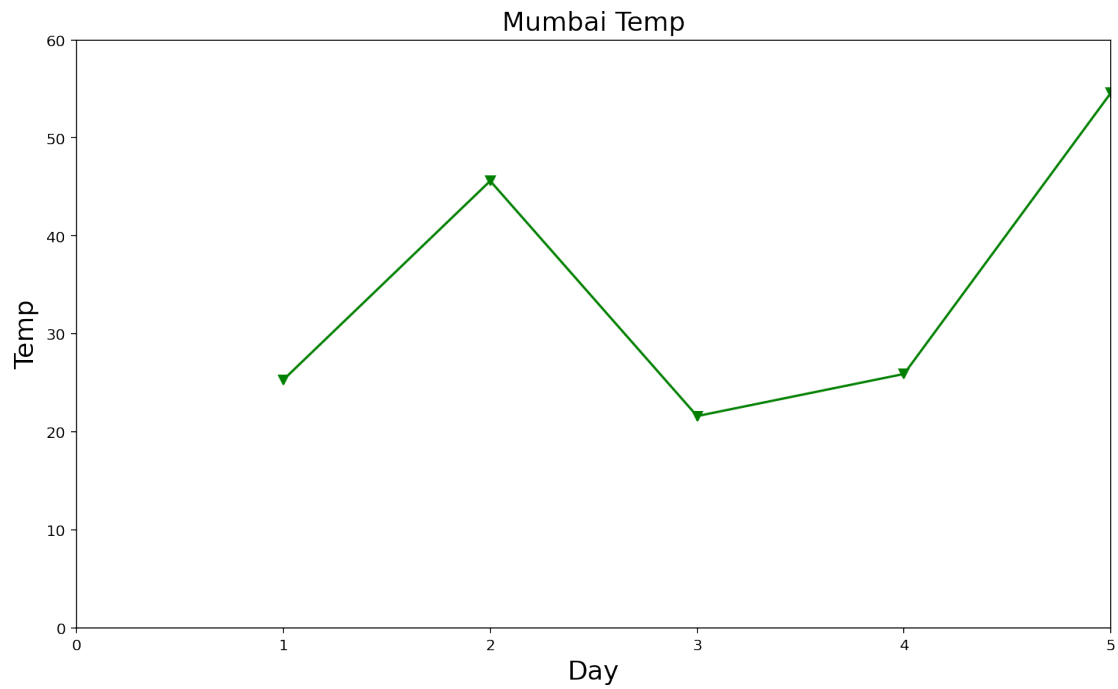
```
[7]: plt.plot(Day,Temp,color='g',marker='o')
plt.title("Mumbai Temp",fontsize=17)
plt.axis([0,5,0,60.0])
plt.xlabel("Day",fontsize=17)
plt.ylabel("Temp",fontsize=17)
plt.show()
```

[7]:



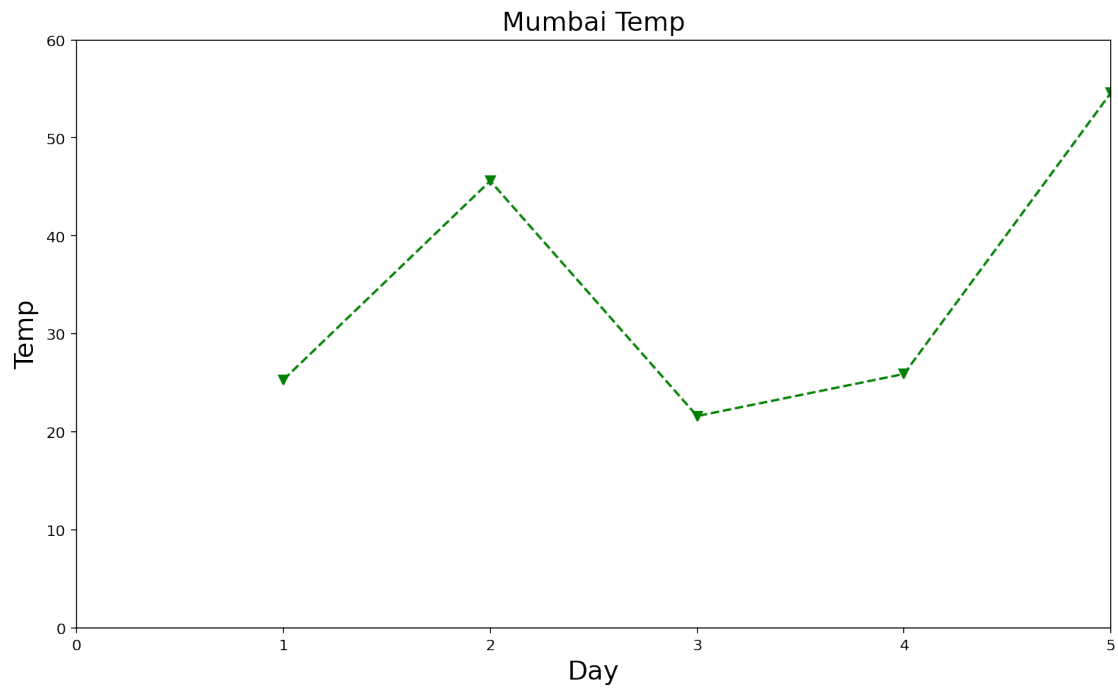
```
[8]: plt.plot(Day,Temp,color='g',marker='v')
plt.title("Mumbai Temp",fontsize=17)
plt.axis([0,5,0,60.0])
plt.xlabel("Day",fontsize=17)
plt.ylabel("Temp",fontsize=17)
plt.show()
```

[8]:



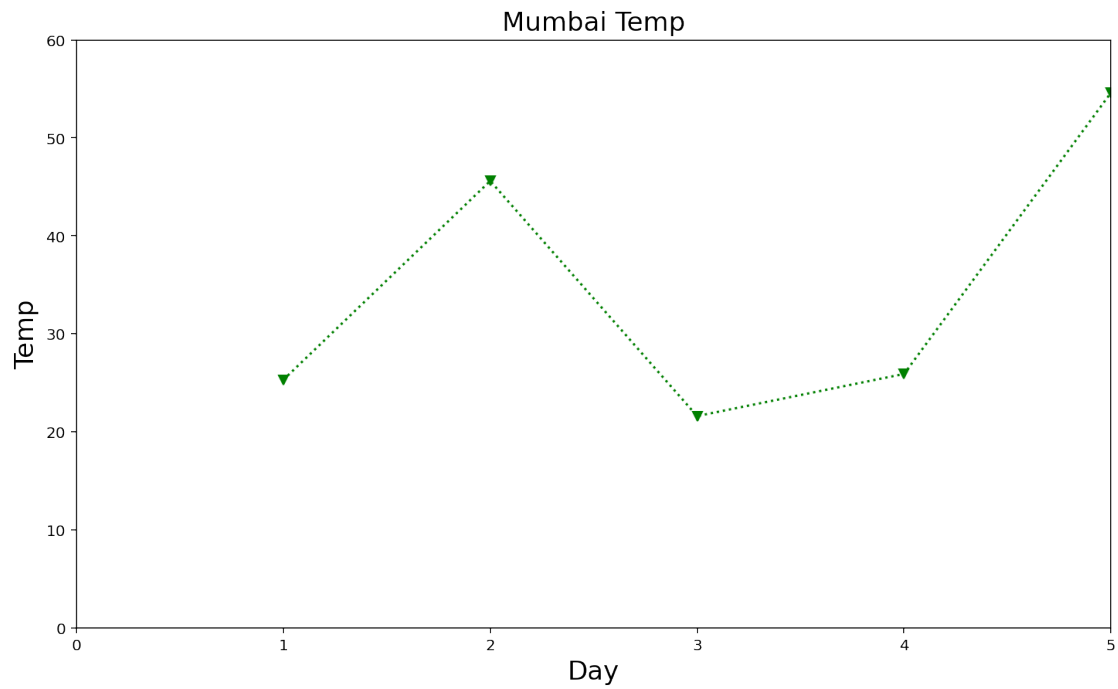
```
[9]: plt.plot(Day,Temp,color='g',marker='v',linestyle='--')
plt.title("Mumbai Temp",fontsize=17)
plt.axis([0,5,0,60.0])
plt.xlabel("Day",fontsize=17)
plt.ylabel("Temp",fontsize=17)
plt.show()
```

[9]:



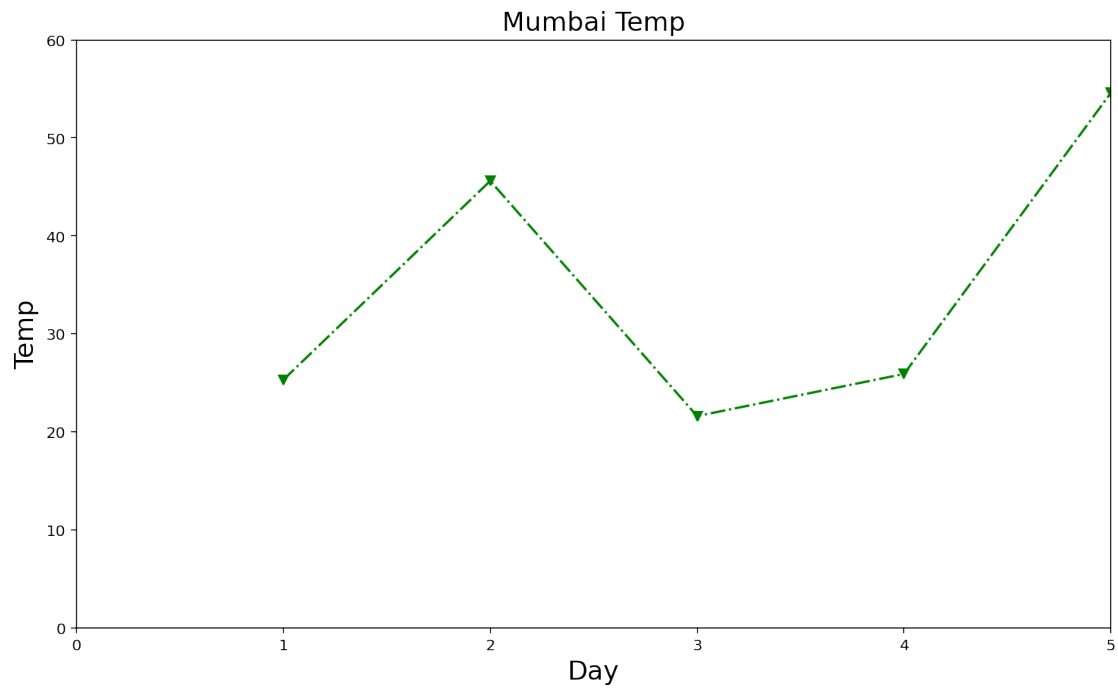
```
[10]: plt.plot(Day,Temp,color='g',marker='v',linestyle=':')  
plt.title("Mumbai Temp",fontsize=17)  
plt.axis([0,5,0,60.0])  
plt.xlabel("Day",fontsize=17)  
plt.ylabel("Temp",fontsize=17)  
plt.show()
```

[10]:



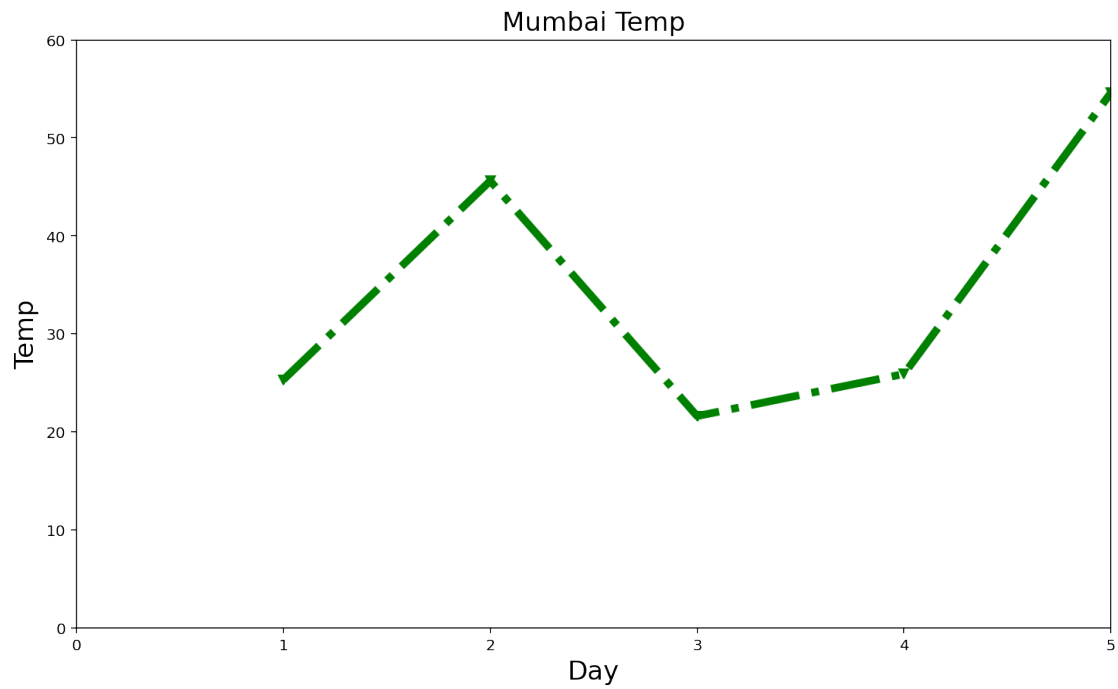
```
[11]: plt.plot(Day,Temp,color='g',marker='v',linestyle='-.')
plt.title("Mumbai Temp",fontsize=17)
plt.axis([0,5,0,60.0])
plt.xlabel("Day",fontsize=17)
plt.ylabel("Temp",fontsize=17)
plt.show()
```

[11]:



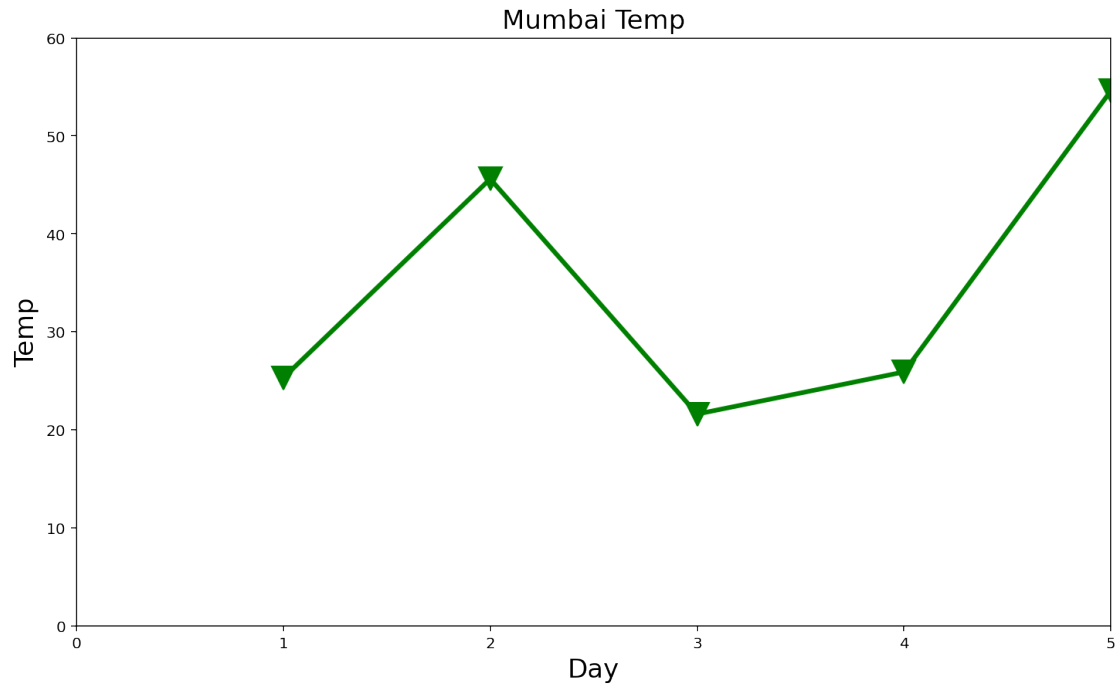
```
[12]: plt.plot(Day,Temp,color='g',marker='v',linestyle='-.',linewidth=5)
plt.title("Mumbai Temp",fontsize=17)
plt.axis([0,5,0,60.0])
plt.xlabel("Day",fontsize=17)
plt.ylabel("Temp",fontsize=17)
plt.show()
```

[12]:



```
[13]: plt.plot(Day,Temp,color='g',marker='v',linewidth=3,markersize=15)
plt.title("Mumbai Temp",fontsize=17)
plt.axis([0,5,0,60.0])
plt.xlabel("Day",fontsize=17)
plt.ylabel("Temp",fontsize=17)
plt.show()
```

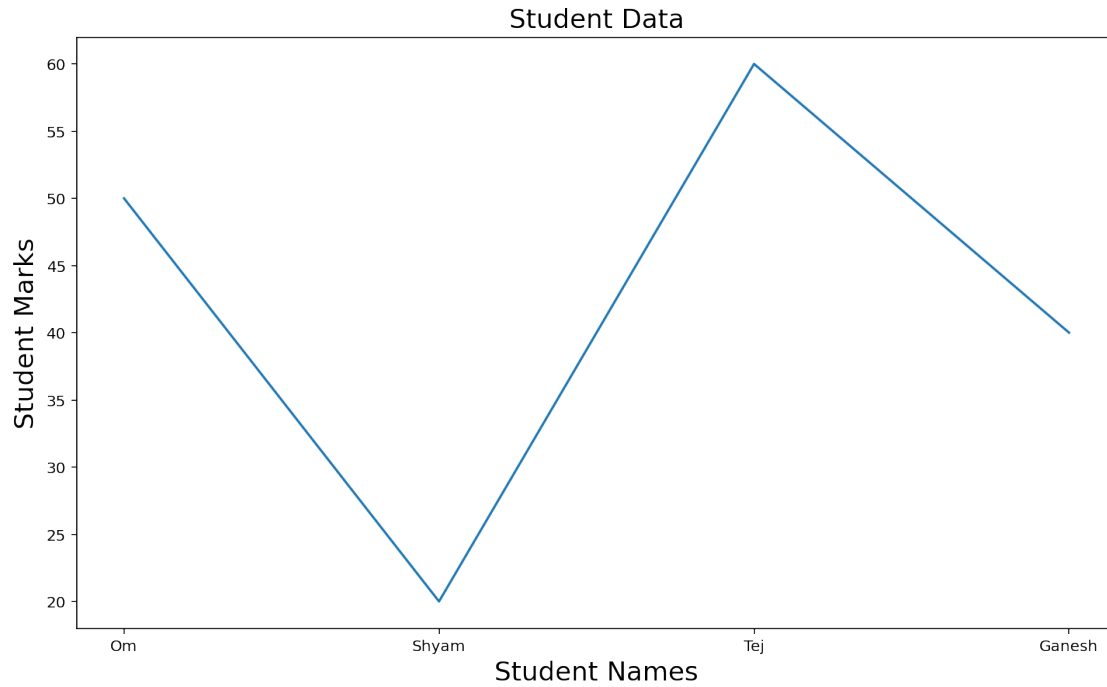
[13]:



How to plot graph using categorical data

```
[14]: import matplotlib.pyplot as plt
Names=['Om','Shyam','Tej','Ganesh']
Marks=[50,20,60,40]
plt.title("Student Data",fontsize=17)
plt.xlabel("Student Names",fontsize=17)
plt.ylabel("Student Marks",fontsize=17)
plt.plot(Names,Marks)
plt.show()
```

[14]:



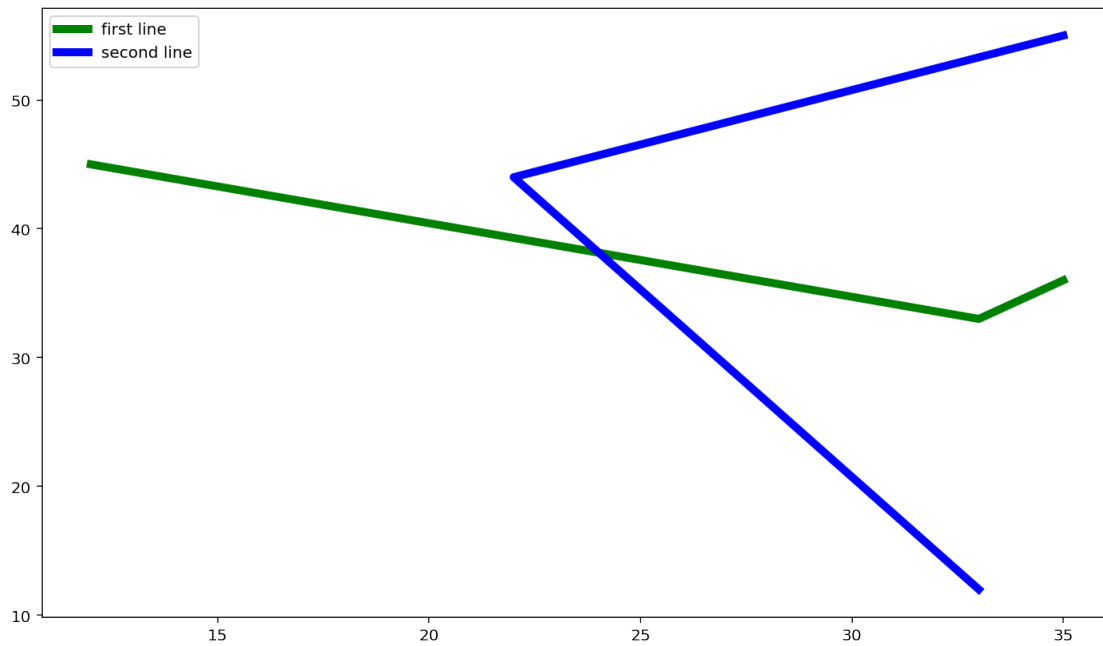
Legend() and Grid() function in matplotlib

```
[15]: import matplotlib.pyplot as plt
```

```
[16]: x = [12,33,35]  
y = [45,33,36]  
x1 = [33,22,35]  
y1 = [12,44,55]
```

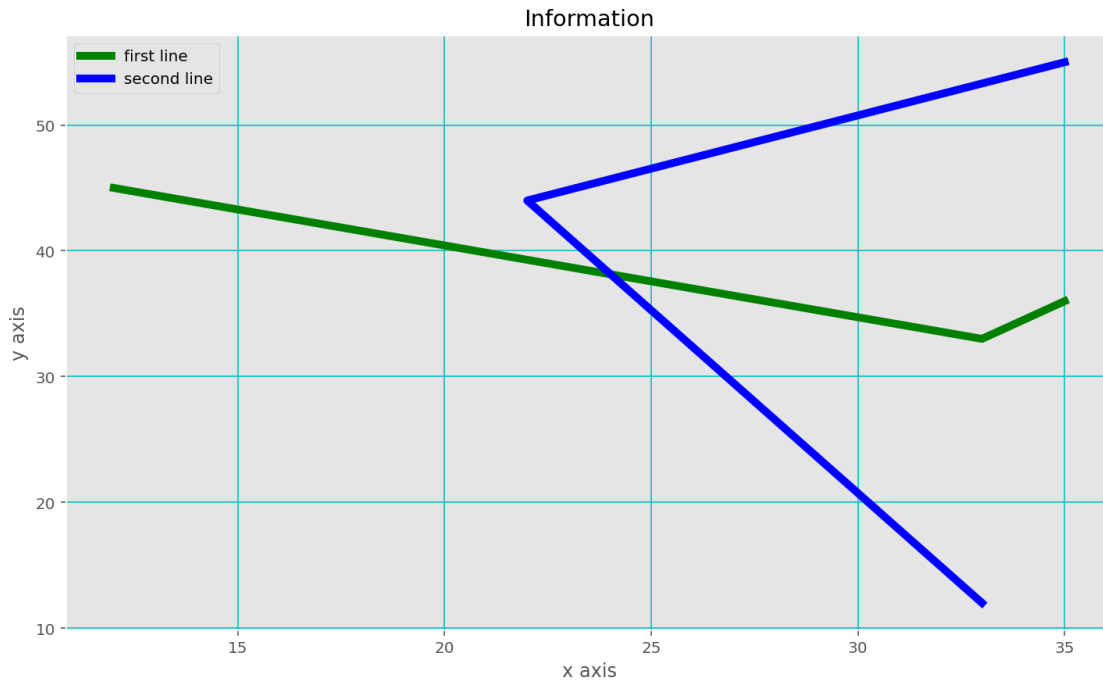
```
[17]: plt.plot(x,y, color='g',label="first line", linewidth=5)  
plt.plot(x1,y1, color='b',label="second line", linewidth=5)  
plt.legend(loc=2)  
plt.show()
```

```
[17]:
```



```
[18]: from matplotlib import style
style.use('ggplot')
plt.plot(x,y, color='g',label="first line", linewidth=5)
plt.title("Information")
plt.xlabel("x axis")
plt.ylabel("y axis")
plt.plot(x1,y1, color='b',label="second line", linewidth=5)
plt.grid(True,color='c')
plt.legend(loc=2)
plt.show()
```

[18]:

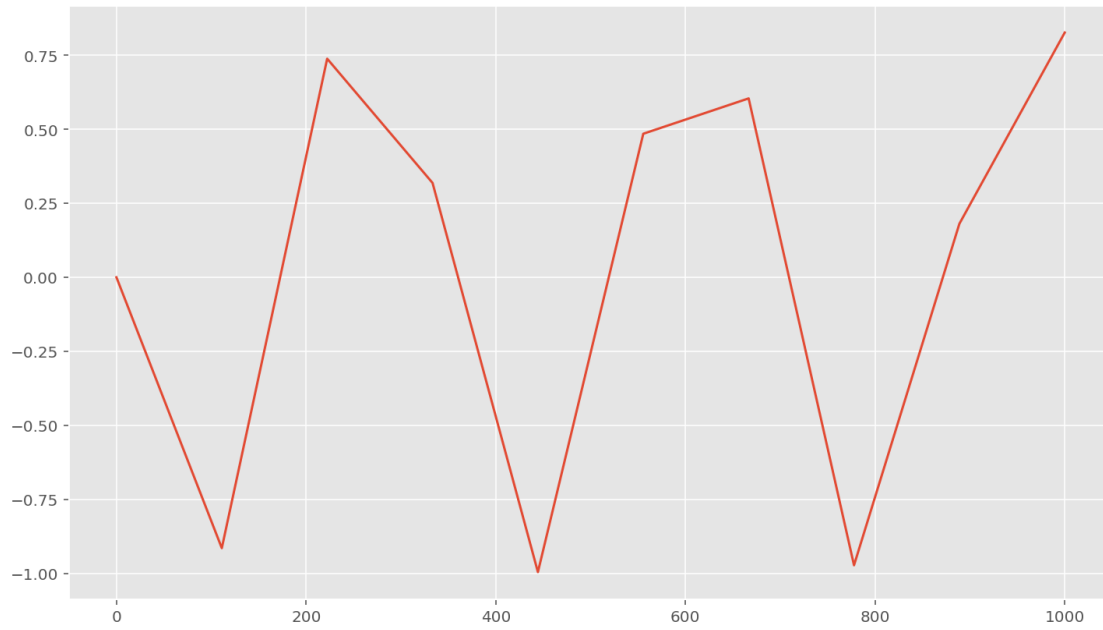


How to plot graph using trigonometric function

```
[19]: import numpy as np
import matplotlib.pyplot as plt
```

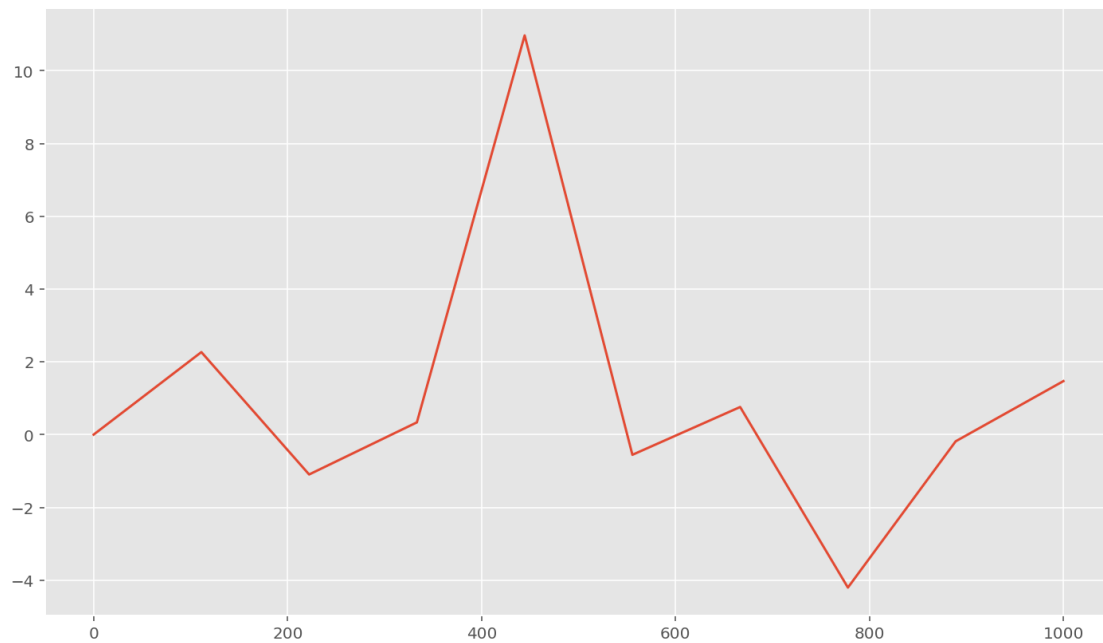
```
[20]: fig = plt.figure()
ax = plt.axes()
x = np.linspace(0,1000,10)
ax.plot(x,np.sin(x))
plt.show()
```

[20]:



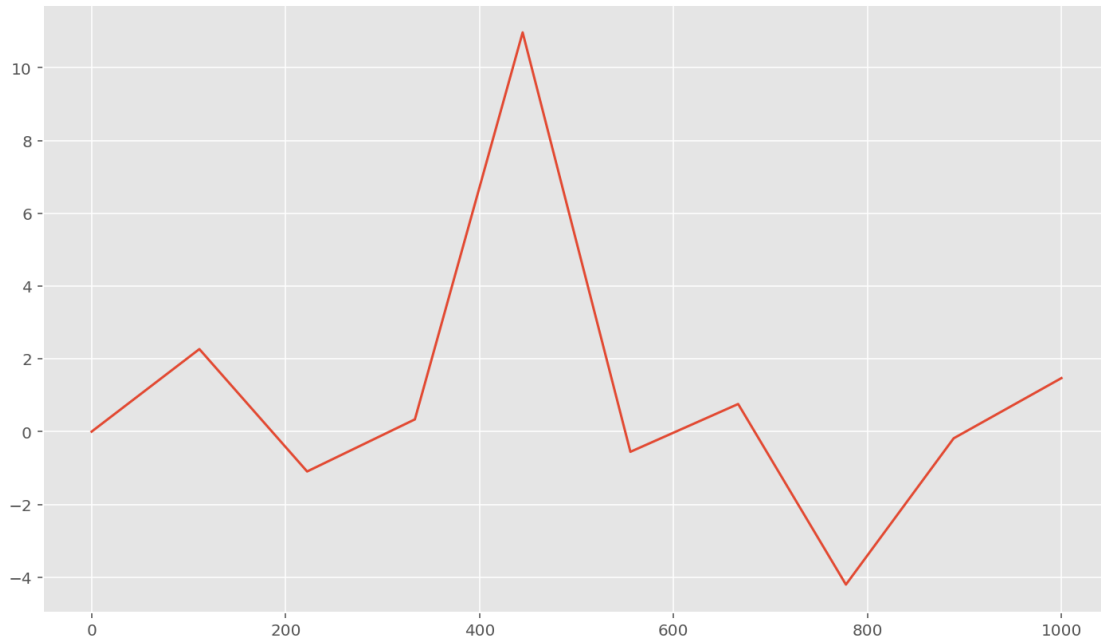
```
[21]: fig = plt.figure()
      ax = plt.axes()
      x = np.linspace(0,1000,10)
      ax.plot(x,np.tan(x))
      plt.show()
```

[21]:



```
[22]: fig = plt.figure()
      ax = plt.axes()
      x = np.linspace(0,1000,10)
      ax.plot(x,np.tan(x))
      plt.show()
```

[22]:



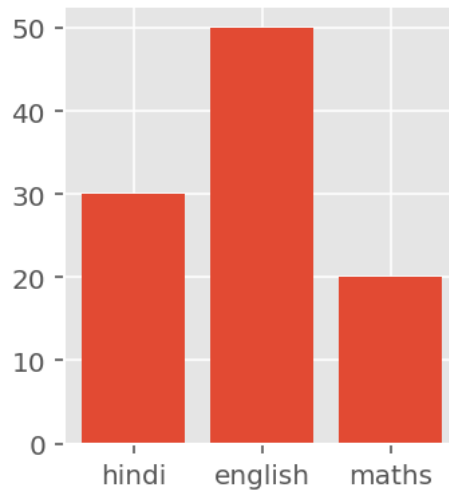
Subplot in matplotlib (python)

```
[23]: import matplotlib.pyplot as plt
```

```
[24]: subject = ['hindi','english','maths']
      marks = [30,50,20]
      plt.figure(figsize=(9,3))
      plt.subplot(1,3,1)
      plt.bar(subject,marks)
```

[24]: <BarContainer object of 3 artists>

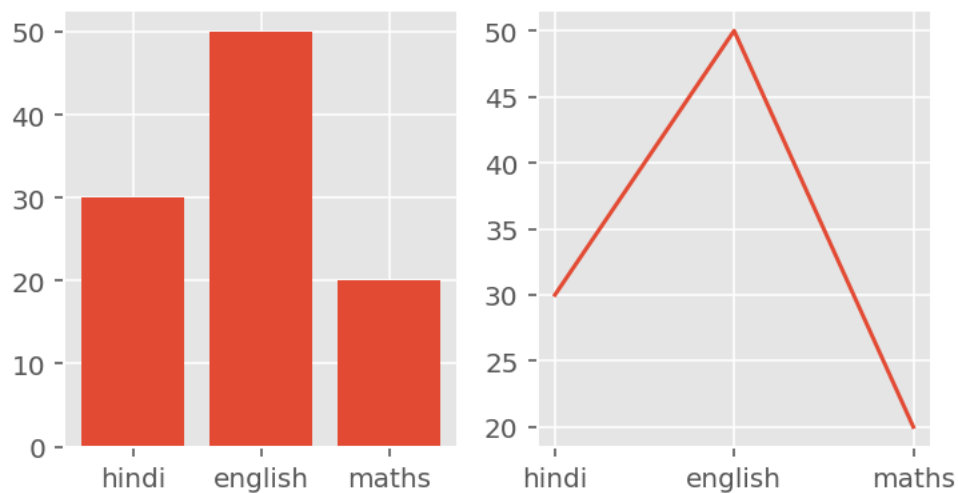
[24]:



```
[25]: subject = ['hindi','english','maths']  
marks = [30,50,20]  
plt.figure(figsize=(9,3))  
plt.subplot(1,3,1)  
plt.bar(subject,marks)  
plt.subplot(1,3,2)  
plt.plot(subject,marks)
```

[25]: [<matplotlib.lines.Line2D at 0x7fe182d43880>]

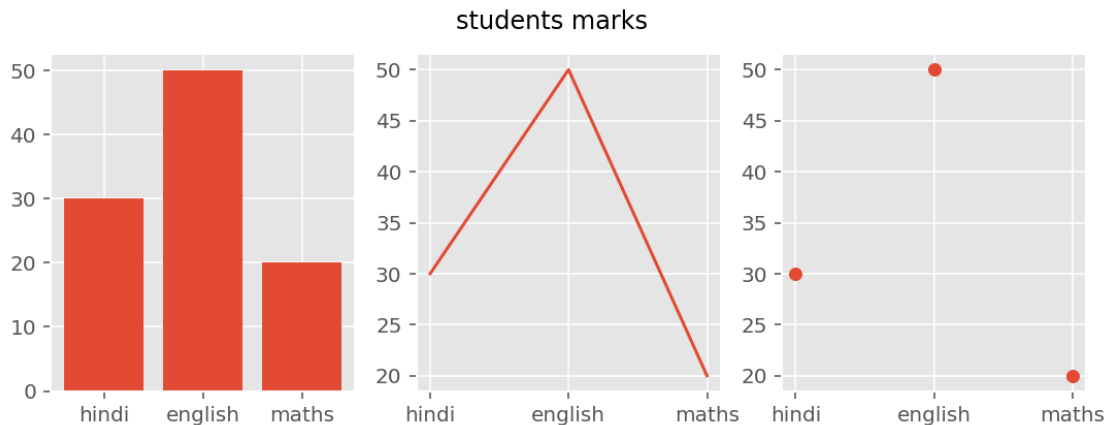
[25]:



```
[26]: subject = ['hindi','english','maths']  
marks = [30,50,20]
```

```
plt.figure(figsize=(9,3))
plt.subplot(1,3,1)
plt.bar(subject,marks)
plt.subplot(1,3,2)
plt.plot(subject,marks)
plt.subplot(1,3,3)
plt.scatter(subject,marks)
plt.suptitle("students marks")
plt.show()
```

[26]:



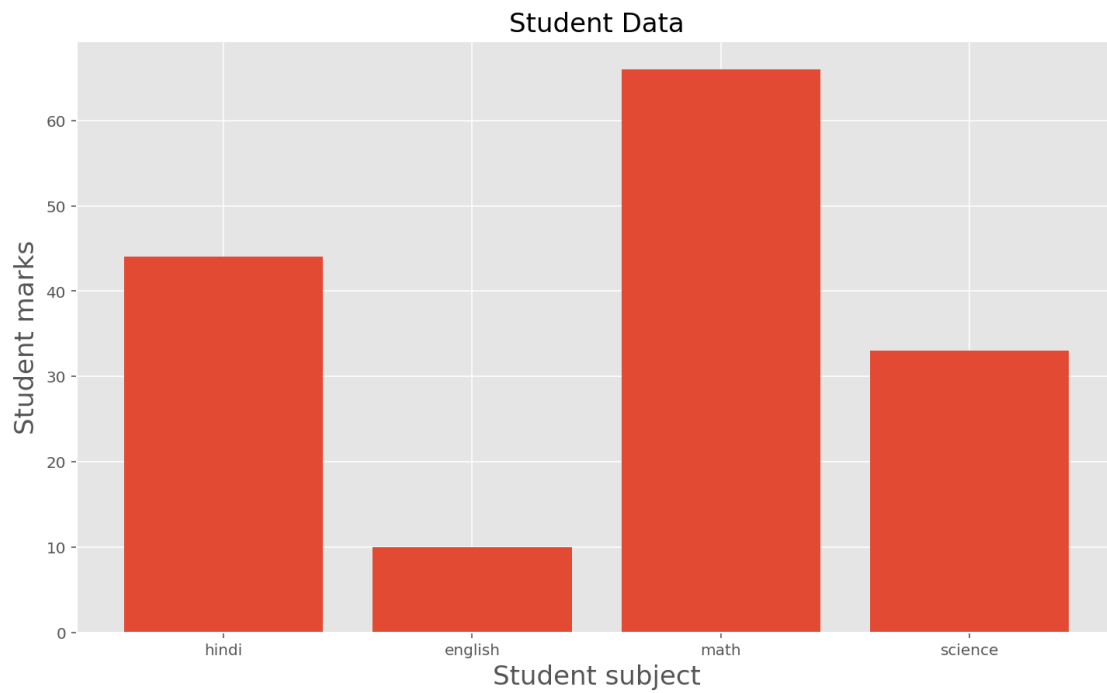
Bar Graph

[27]: `import matplotlib.pyplot as plt`

[28]: `sub = ['hindi', 'english', 'math', 'science']
mark = [44,10,66,33]`

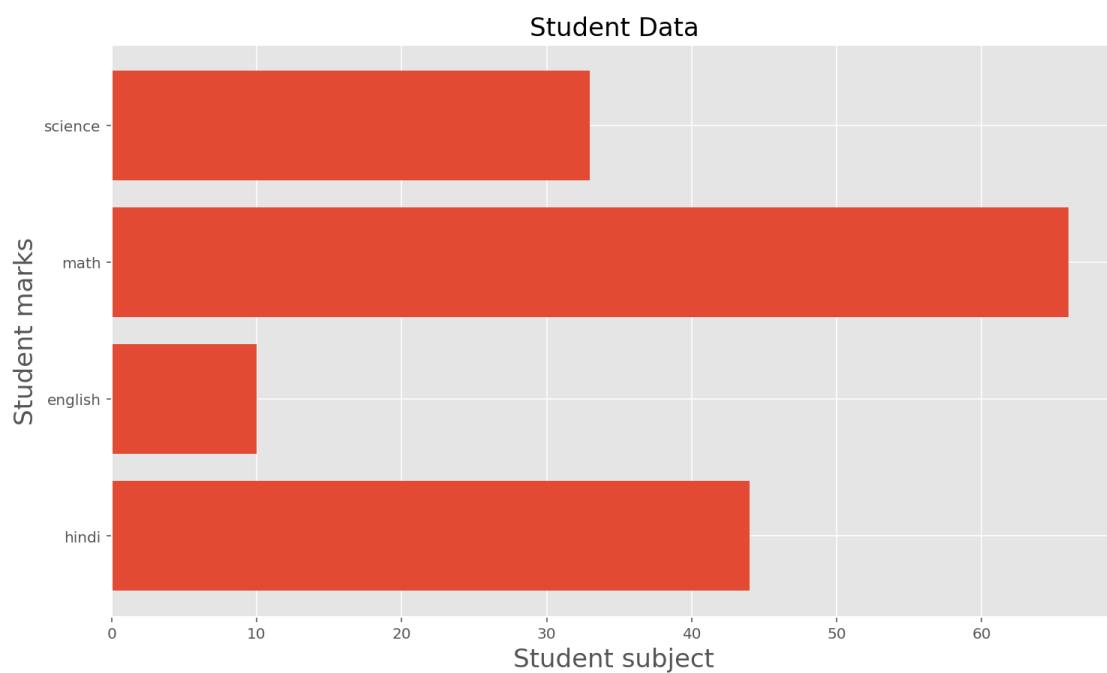
[29]: `plt.bar(sub, mark)
plt.title("Student Data",fontsize=17)
plt.xlabel("Student subject",fontsize=17)
plt.ylabel("Student marks",fontsize=17)
plt.show()`

[29]:

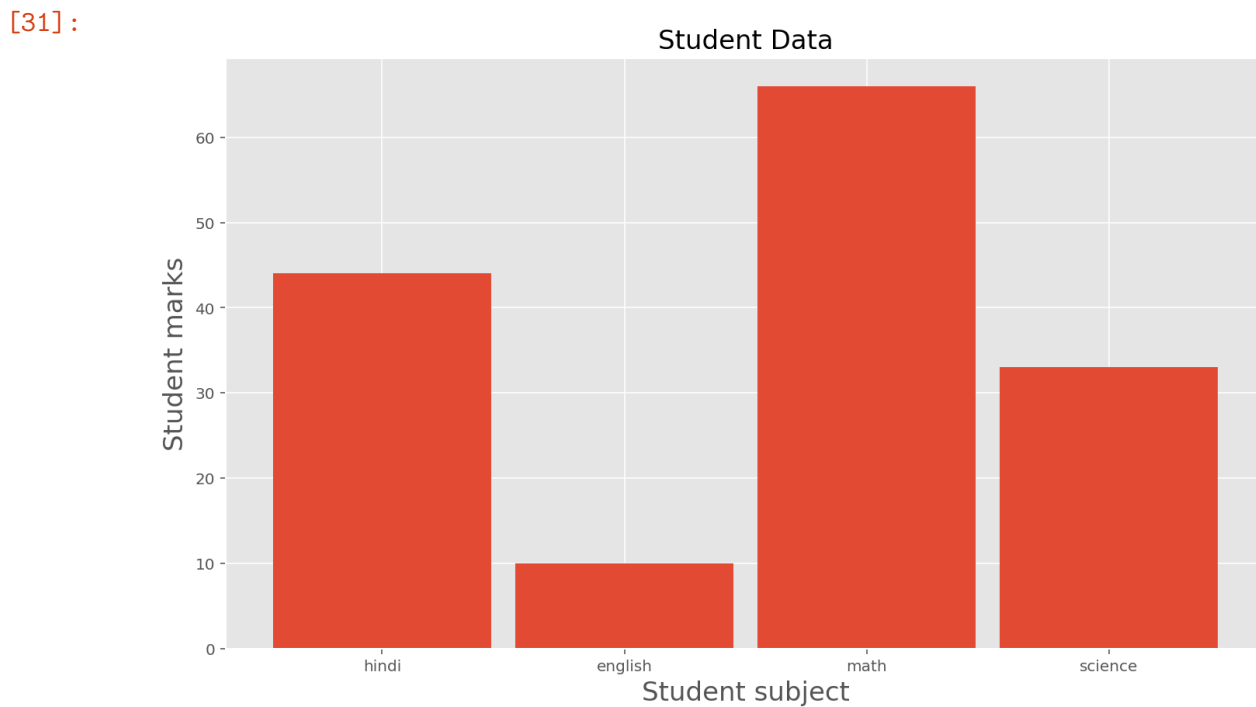


```
[30]: plt.barh(sub, mark)
plt.title("Student Data",fontsize=17)
plt.xlabel("Student subject",fontsize=17)
plt.ylabel("Student marks",fontsize=17)
plt.show()
```

[30]:

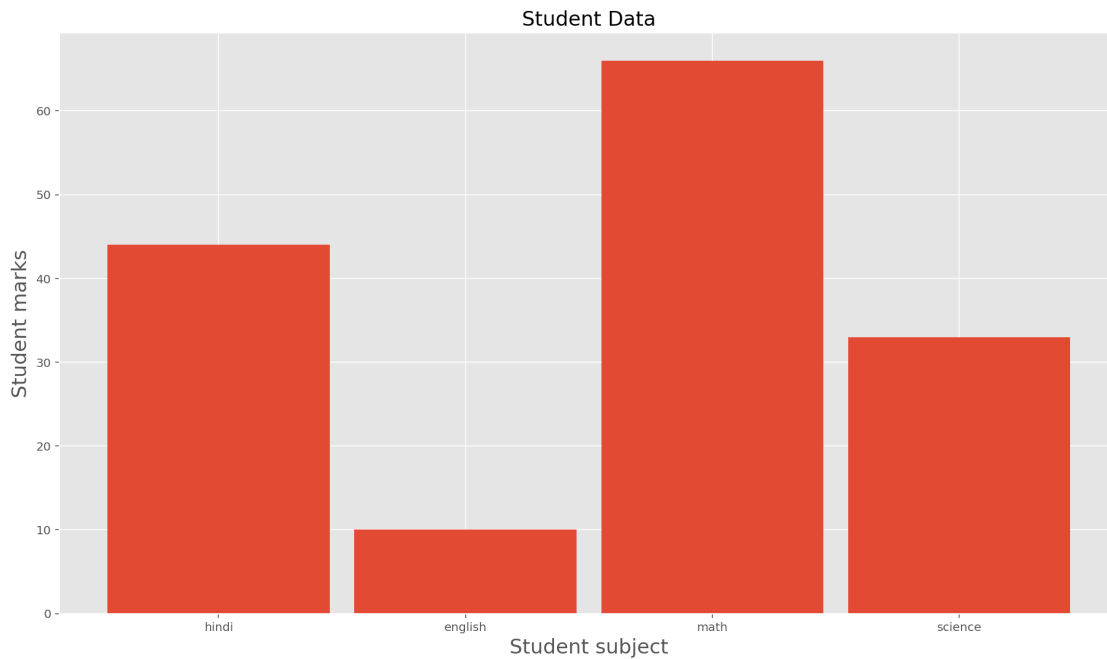


```
[31]: plt.bar(sub, mark, width=0.9)
plt.title("Student Data",fontsize=17)
plt.xlabel("Student subject",fontsize=17)
plt.ylabel("Student marks",fontsize=17)
plt.show()
```



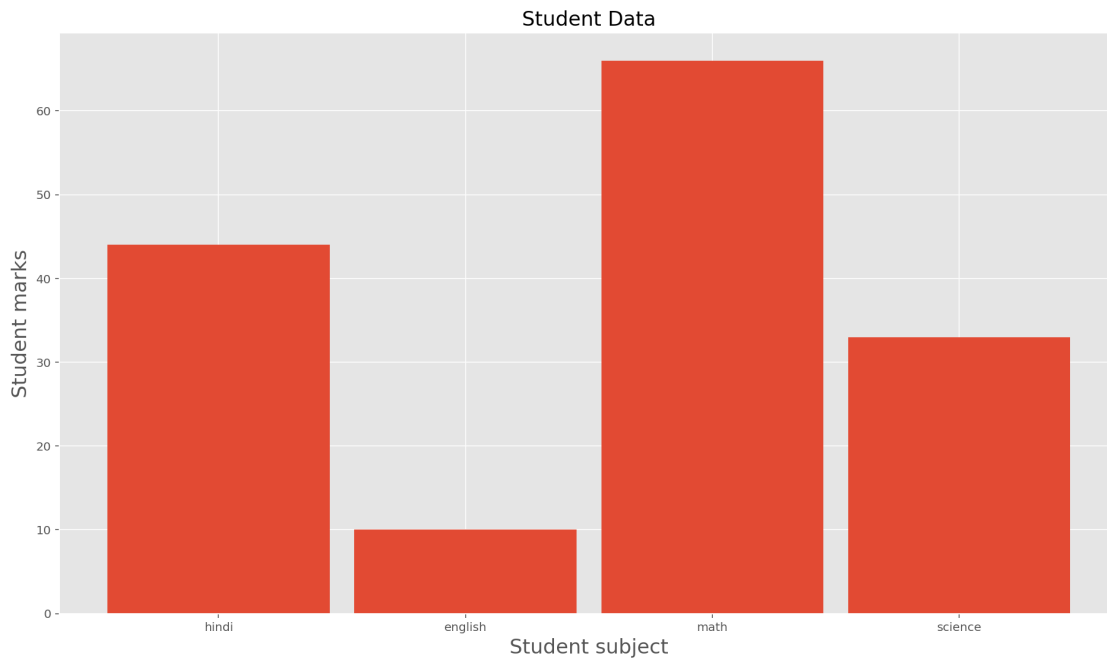
```
[32]: plt.figure(figsize=(16,9))
plt.bar(sub, mark, width=0.9)
plt.title("Student Data",fontsize=17)
plt.xlabel("Student subject",fontsize=17)
plt.ylabel("Student marks",fontsize=17)
plt.show()
```

[32]:



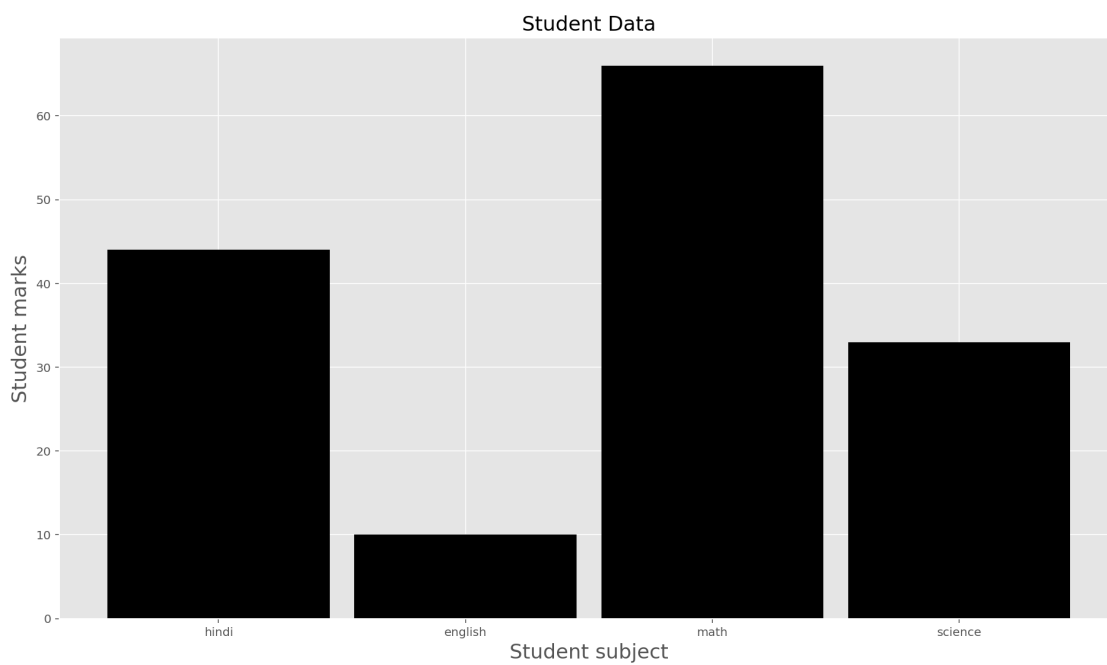
```
[33]: from matplotlib import style
style.use("ggplot")
plt.figure(figsize=(16,9))
plt.bar(sub, mark, width=0.9)
plt.title("Student Data",fontsize=17)
plt.xlabel("Student subject",fontsize=17)
plt.ylabel("Student marks",fontsize=17)
plt.show()
```

[33]:



```
[34]: plt.figure(figsize=(16,9))
plt.bar(sub, mark, width=0.9, color='black')
plt.title("Student Data",fontsize=17)
plt.xlabel("Student subject",fontsize=17)
plt.ylabel("Student marks",fontsize=17)
plt.show()
```

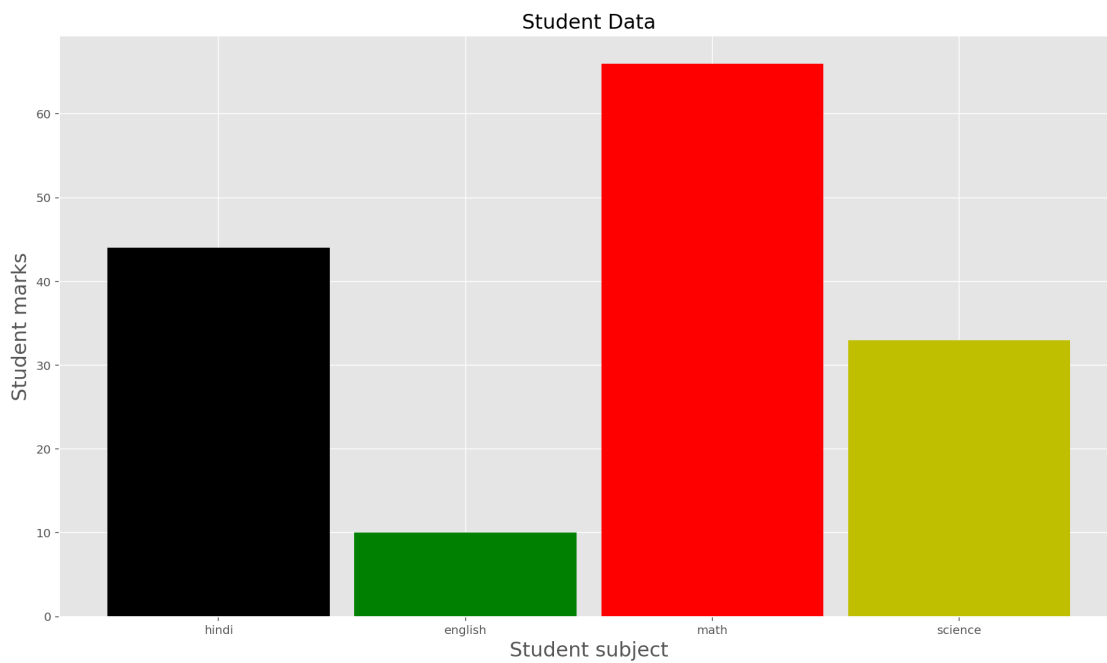
[34]:



Color of all Individual Graph has been changed

```
[35]: plt.figure(figsize=(16,9))
color = ['k','g','r','y']
plt.bar(sub, mark, width=0.9, color=color)
plt.title("Student Data",fontsize=17)
plt.xlabel("Student subject",fontsize=17)
plt.ylabel("Student marks",fontsize=17)
plt.show()
```

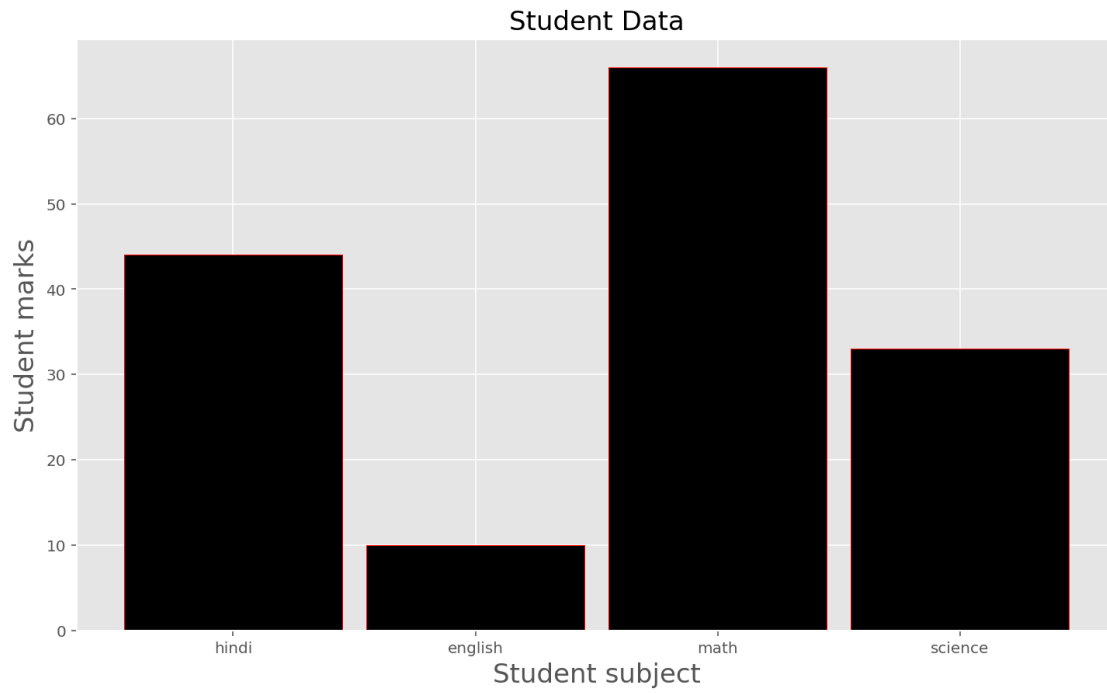
[35]:



Bar graph (Different parameter)

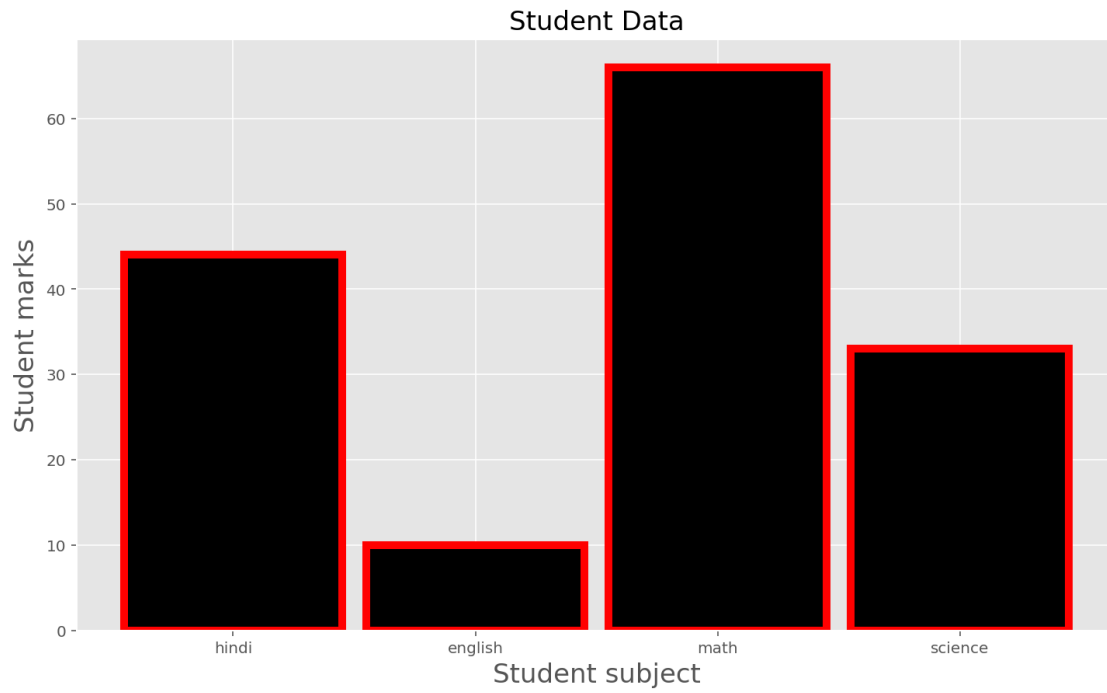
```
[36]: plt.bar(sub, mark, width=0.9, color='k',edgecolor='r')
plt.title("Student Data",fontsize=17)
plt.xlabel("Student subject",fontsize=17)
plt.ylabel("Student marks",fontsize=17)
plt.show()
```

[36]:



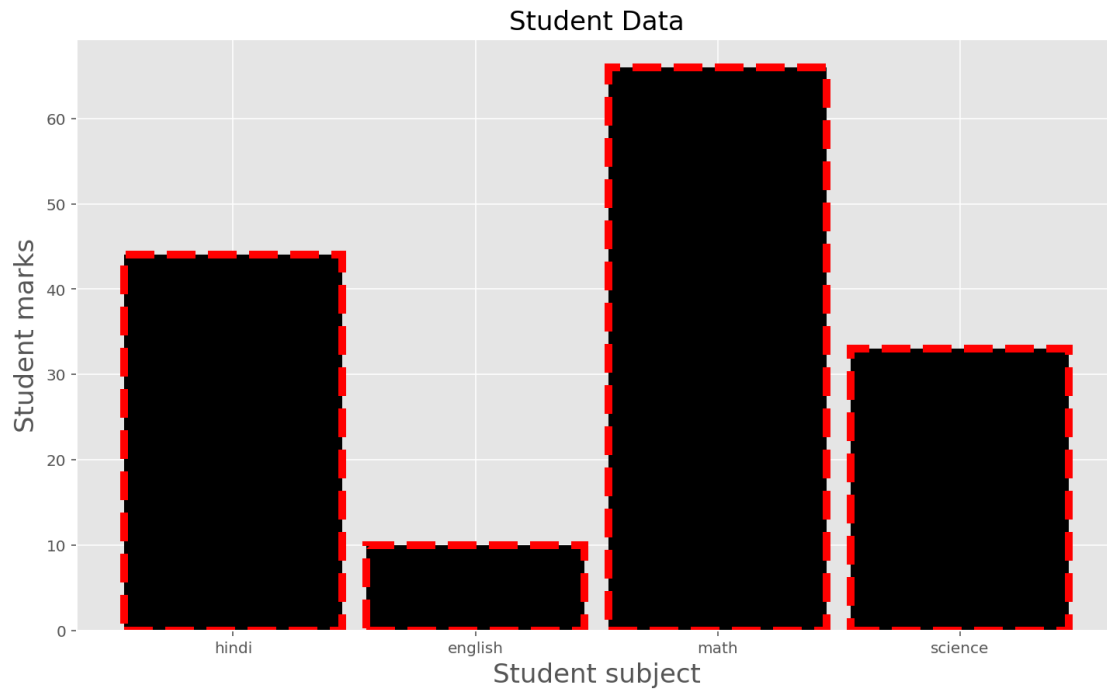
```
[37]: plt.bar(sub, mark, width=0.9, color='k',edgecolor='r',linewidth=5)
plt.title("Student Data",fontsize=17)
plt.xlabel("Student subject",fontsize=17)
plt.ylabel("Student marks",fontsize=17)
plt.show()
```

[37]:



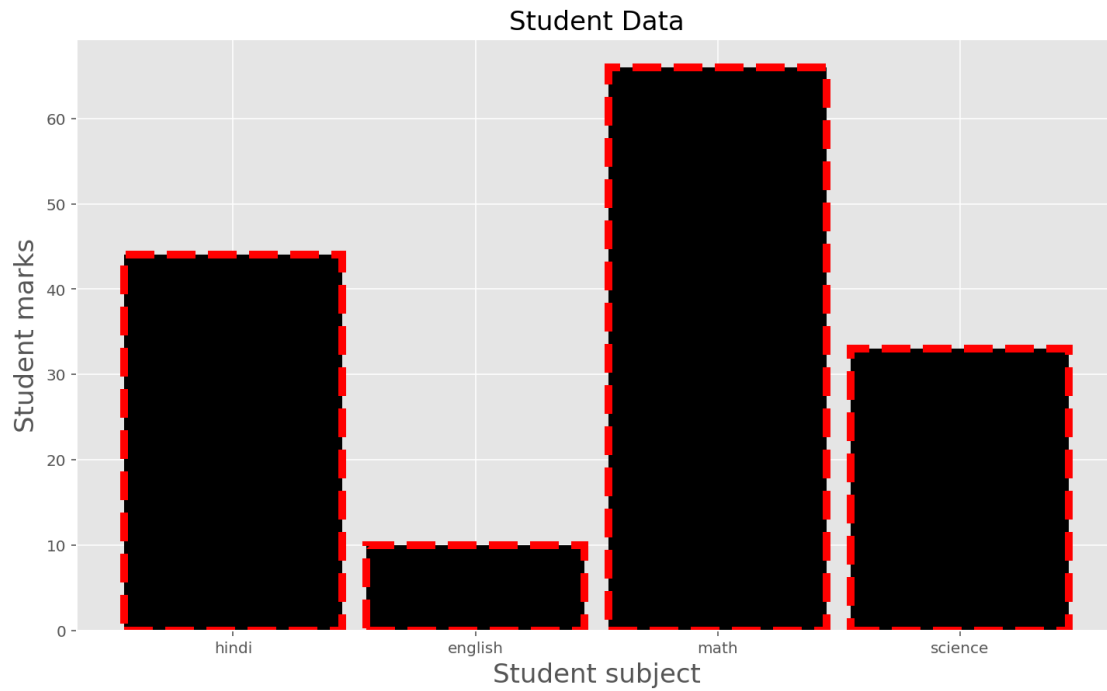
```
[38]: plt.bar(sub, mark, width=0.9, color='k',edgecolor='r',linewidth=5,↵  
        ↳linestyle='--')  
plt.title("Student Data",fontsize=17)  
plt.xlabel("Student subject",fontsize=17)  
plt.ylabel("Student marks",fontsize=17)  
plt.show()
```

[38]:



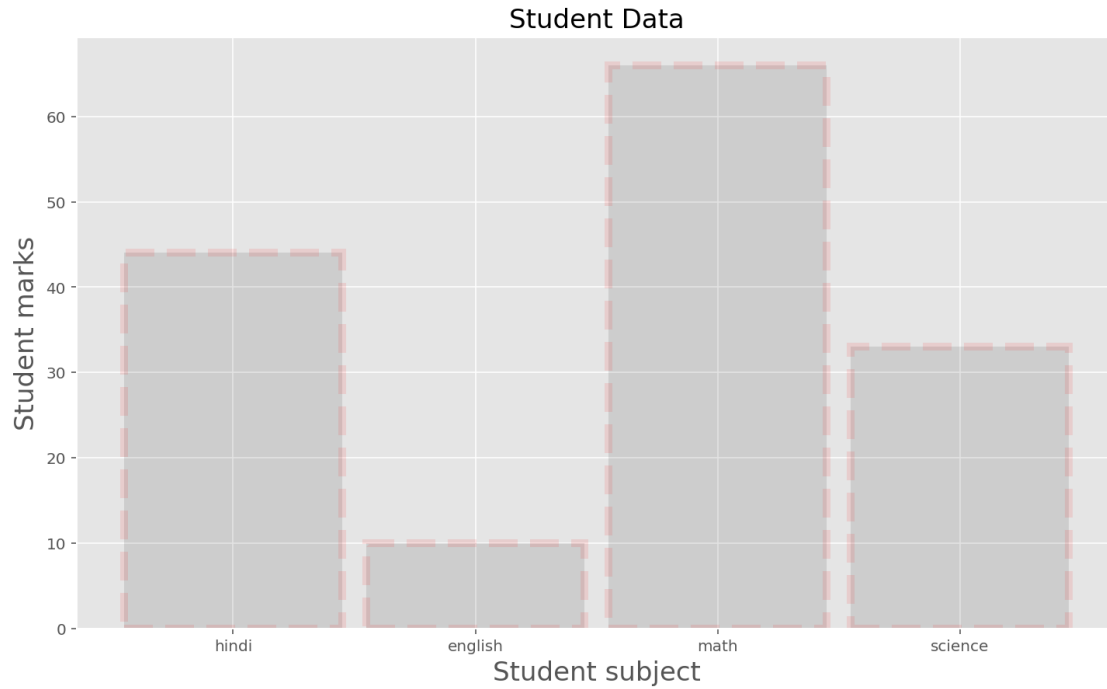
```
[39]: plt.bar(sub, mark, width=0.9, color='k',edgecolor='r',linewidth=5,□  
      ↪linestyle='--',align='center')  
plt.title("Student Data",fontsize=17)  
plt.xlabel("Student subject",fontsize=17)  
plt.ylabel("Student marks",fontsize=17)  
plt.show()
```

[39]:



```
[40]: plt.bar(sub, mark, width=0.9, color='k',edgecolor='r',linewidth=5,□  
      ↪linestyle='--',align='center',alpha=0.1)  
plt.title("Student Data",fontsize=17)  
plt.xlabel("Student subject",fontsize=17)  
plt.ylabel("Student marks",fontsize=17)  
plt.show()
```

[40]:



COLUMN ON TWO AXIS

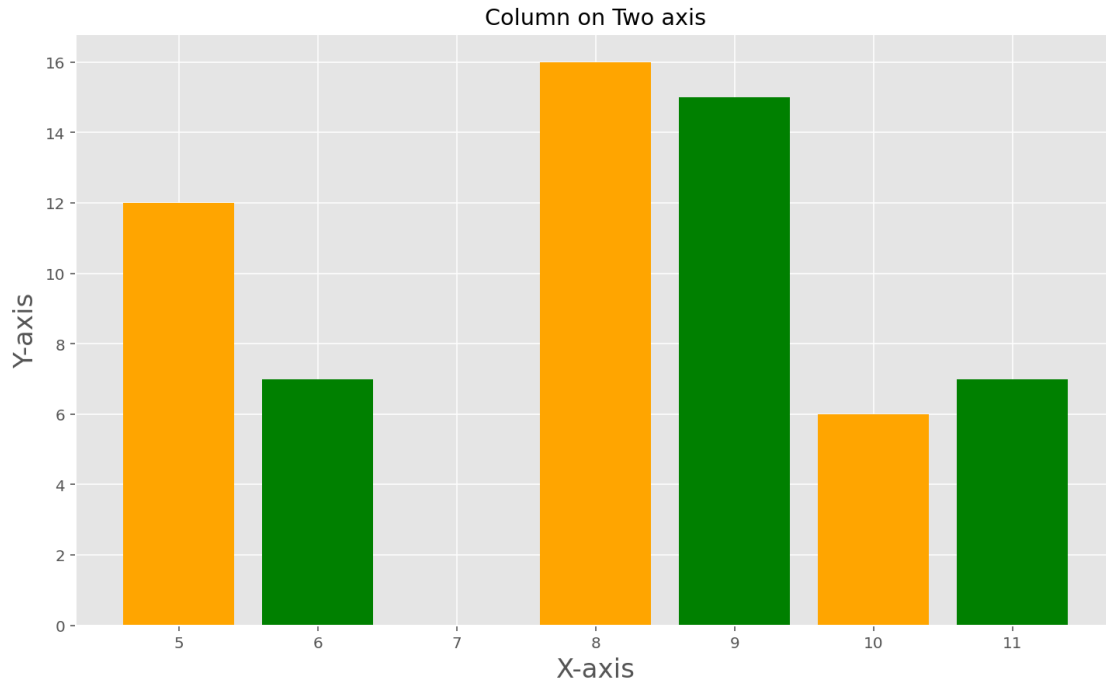
```
[41]: import matplotlib.pyplot as plt
      from matplotlib import style
```

```
[42]: x = [5,8,10]
      y = [12,16,6]

      x1 = [6,9,11]
      y1 = [7,15,7]
```

```
[43]: plt.bar(x,y,color='orange',align='center')
      plt.bar(x1,y1,color='green',align='center')
      plt.title("Column on Two axis")
      plt.xlabel("X-axis",fontsize=17)
      plt.ylabel("Y-axis",fontsize=17)
      plt.show()
```

```
[43]:
```



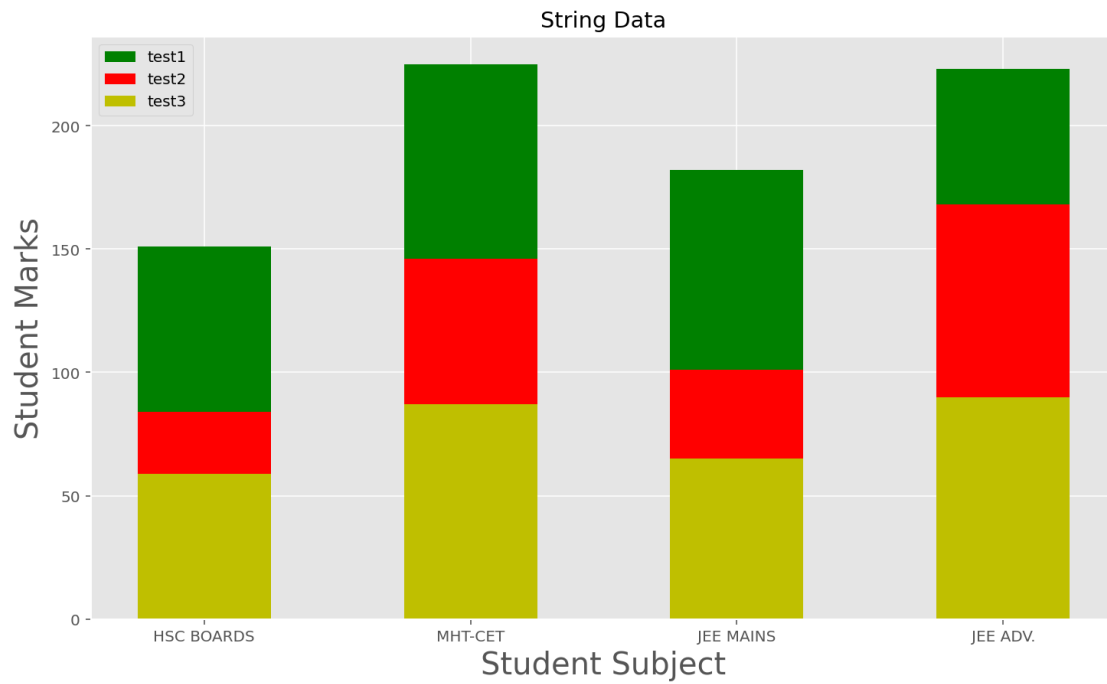
```
[44]: import matplotlib.pyplot as plt
import numpy as np
```

```
[45]: subject = ['HSC BOARDS', 'MHT-CET', 'JEE MAINS', 'JEE ADV.',]
test1 = np.array([67,79,81,55])
test2 = np.array([25,59,36,78])
test3 = np.array([59,87,65,90])
```

```
[46]: info = [x for x,_ in enumerate(subject)]
```

```
[47]: plt.bar(info,test1, width=0.5,label='test1',color='g',bottom=test2+test3)
plt.bar(info,test2,width=0.5,label='test2',color='r',bottom=test3)
plt.bar(info,test3,width=0.5,color='y',label='test3')
plt.xticks(info,subject)
plt.legend()
plt.title("String Data")
plt.xlabel("Student Subject",fontsize=20)
plt.ylabel("Student Marks",fontsize=20)
plt.show()
```

[47]:



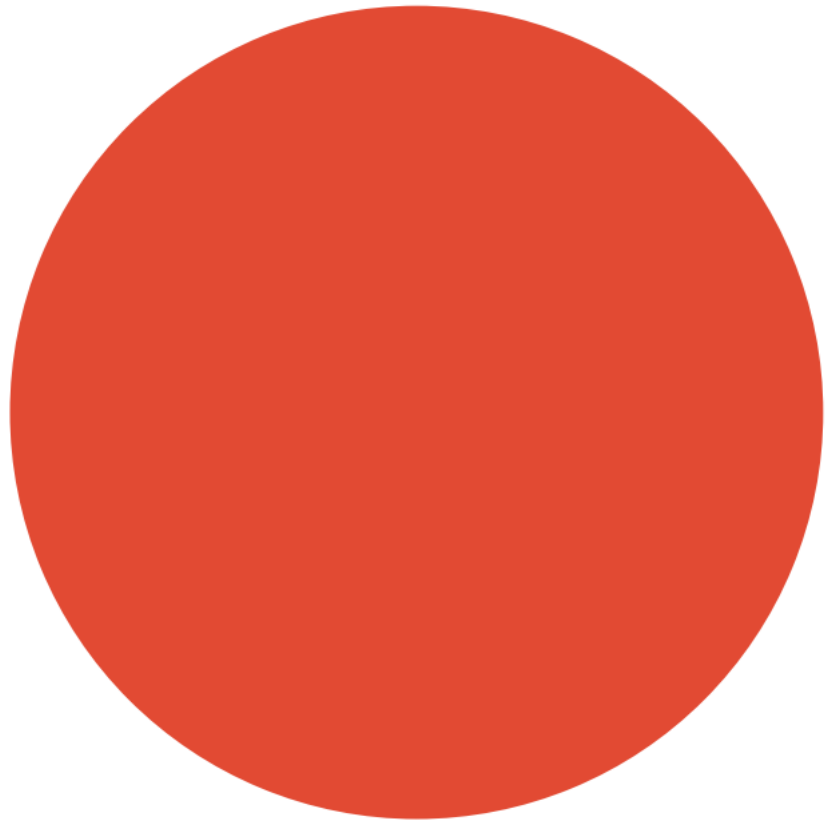
PIE CHART

```
[48]: import matplotlib.pyplot as plt
```

```
[49]: sub = 'hindi','english','math','science'  
mark = [10,55,40,30]
```

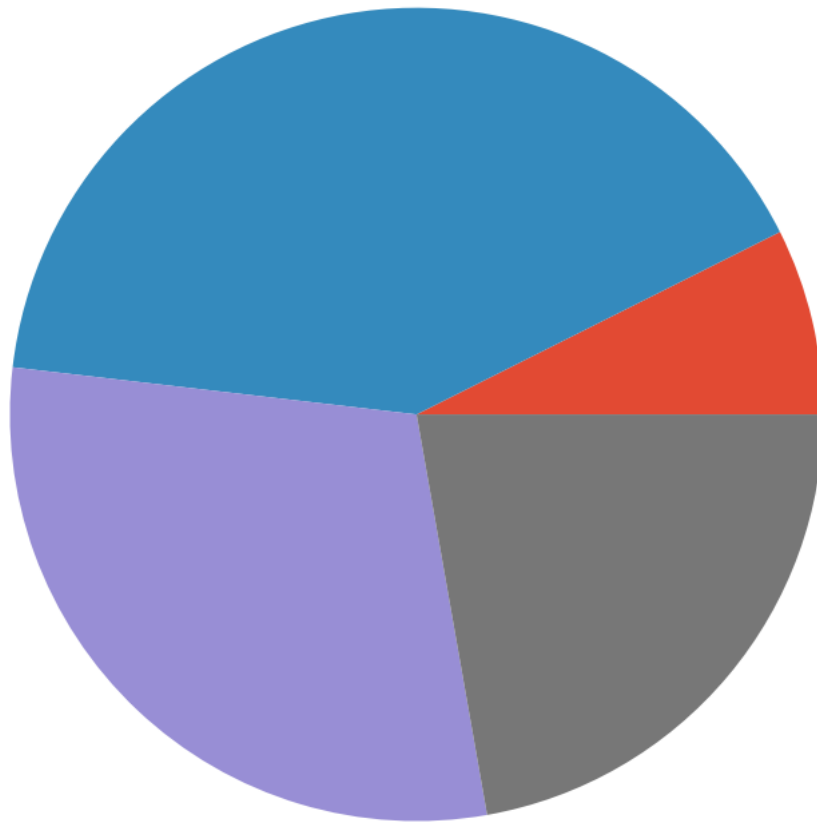
```
[50]: plt.pie([1])  
plt.show()
```

```
[50]:
```



```
[51]: plt.pie(mark)  
      plt.show()
```

[51]:



WITH EXPLODE() FUNCTION WE CAN SEPARATE SLICE

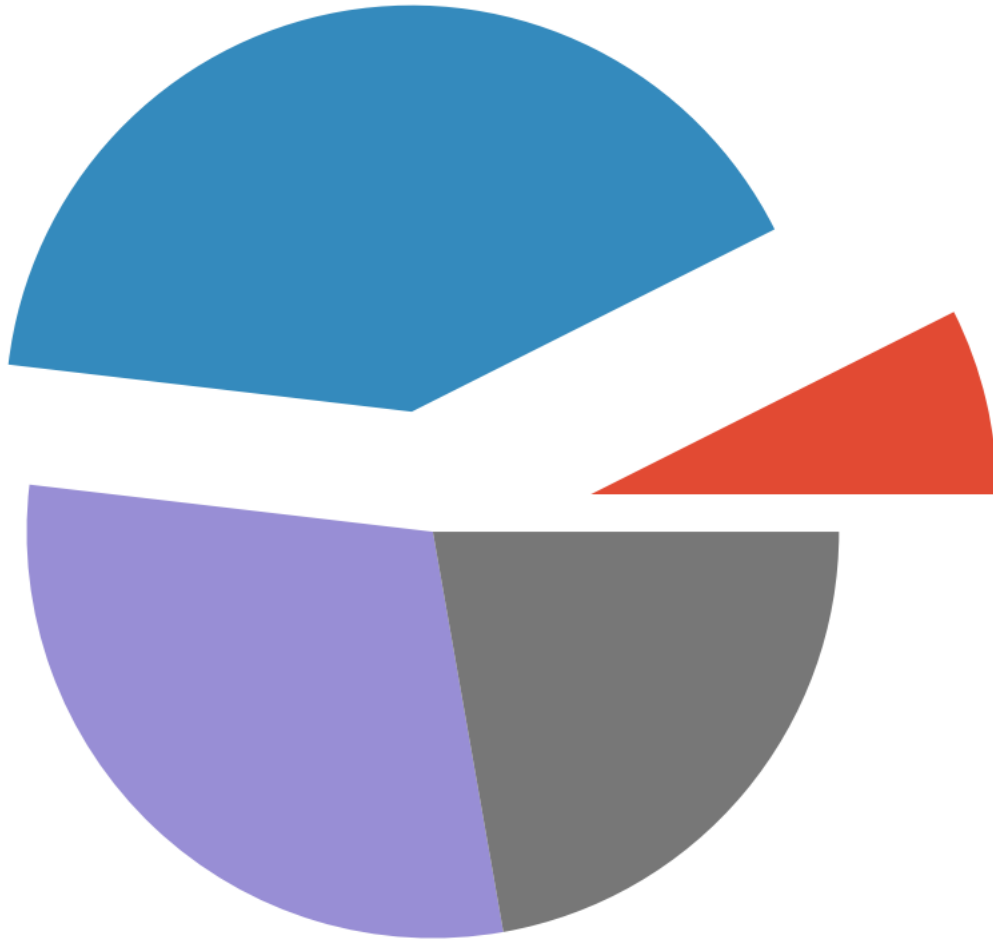
```
[52]: explode = (0,0.3,0,0)
      plt.pie(mark,explode=explode)
      plt.show()
```

[52]:



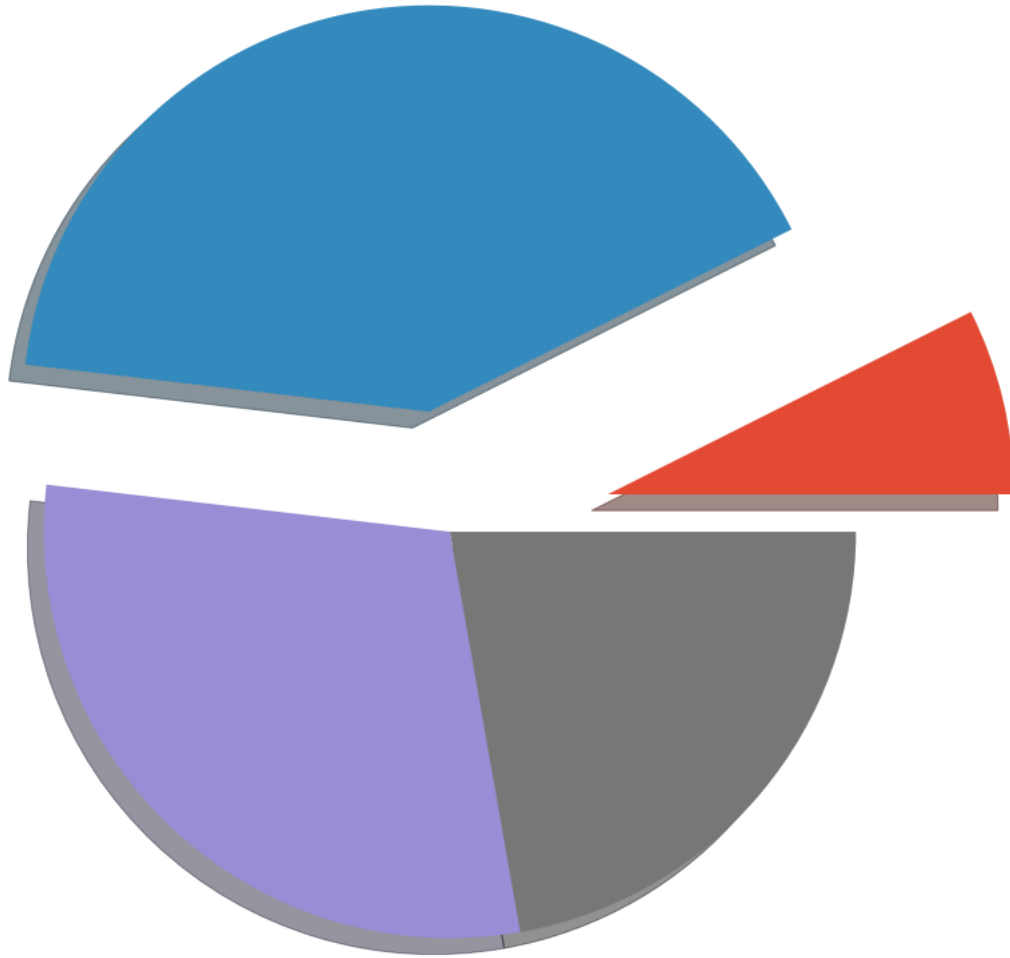
```
[53]: explode = (0.4,0.3,0,0)
plt.pie(mark,explode=explode)
plt.show()
```

[53]:



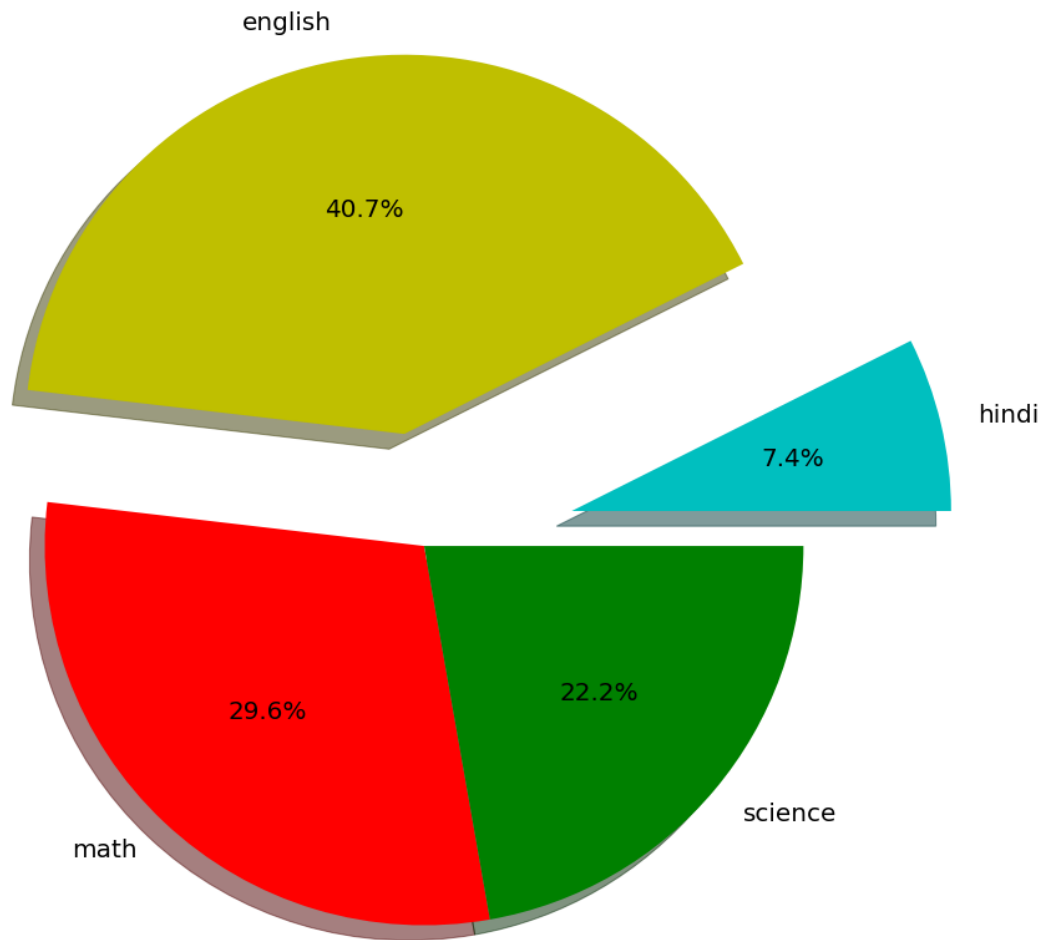
```
[54]: explode = (0.4,0.3,0,0)
plt.pie(mark,explode=explode,shadow=True)
plt.show()
```

[54]:



```
[60]: explode = (0.4,0.3,0,0)
      colors = ['c','y','r','g']
      plt.pie(mark,explode=explode,shadow=True,labels=sub,colors=colors,autopct="%1.
      ↪1f%%")
      plt.show()
```

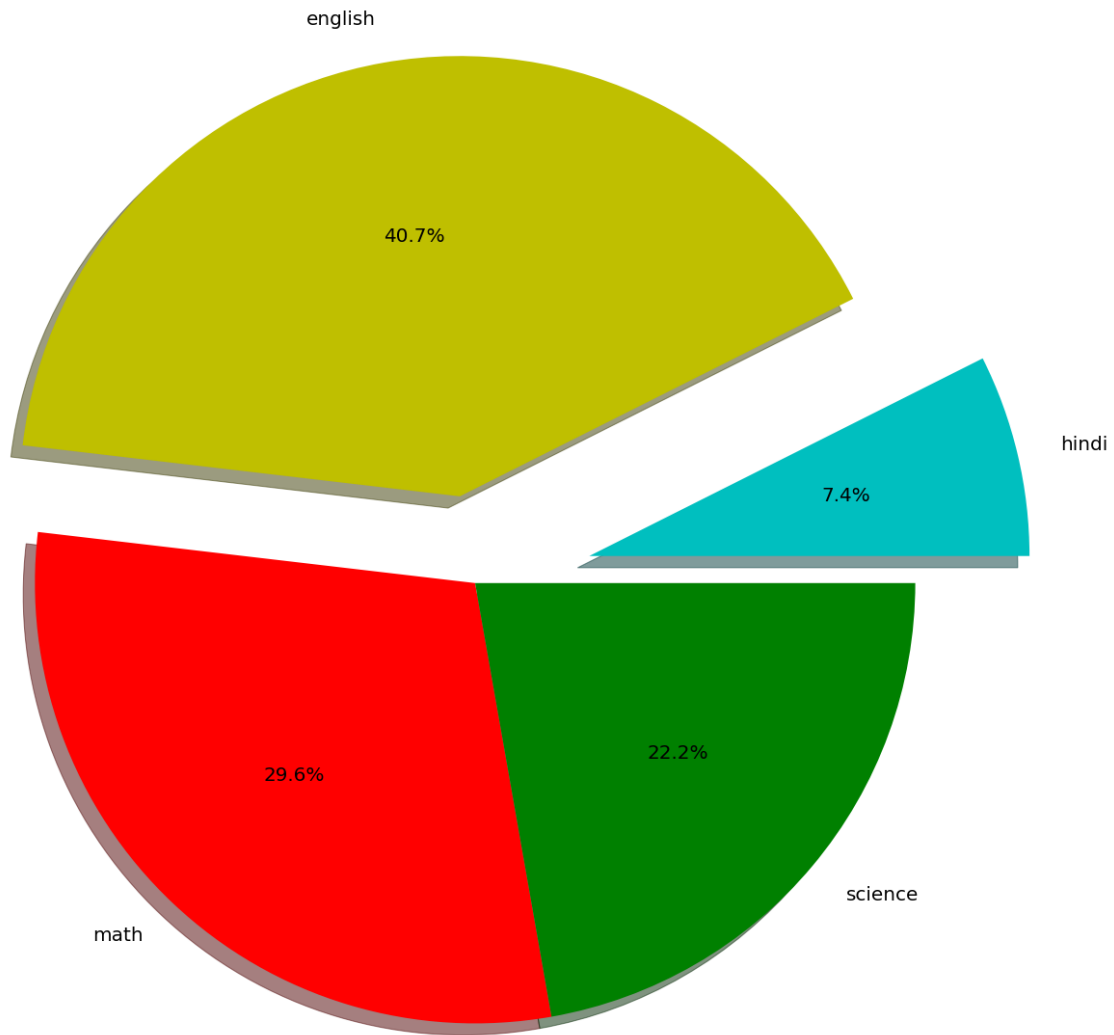
[60]:



HOW TO ADJUST RADIUS OF CIRCLE

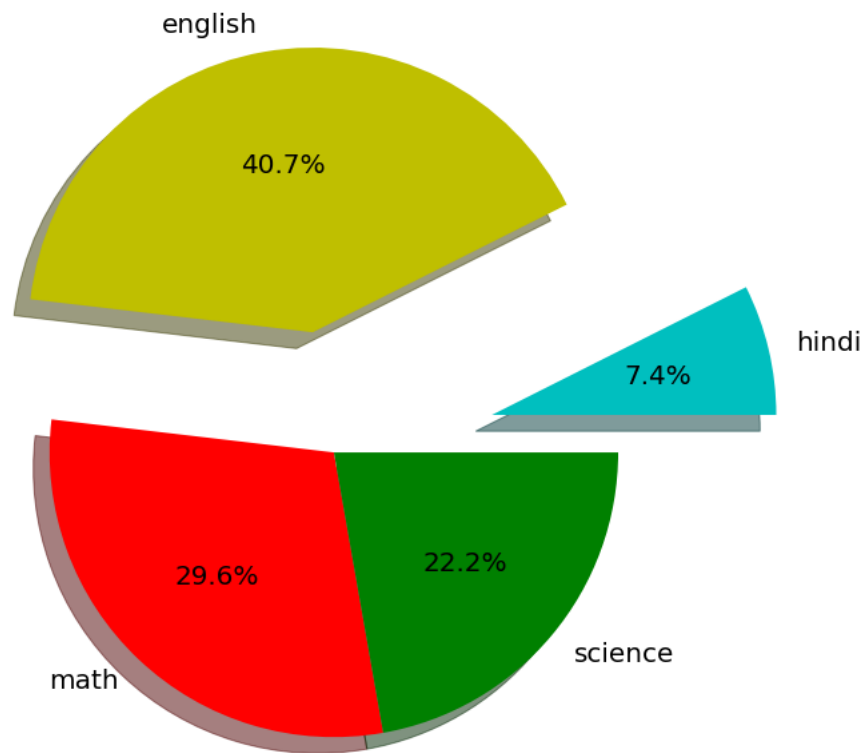
```
[62]: explode = (0.4,0.3,0,0)
      colors = ['c','y','r','g']
      plt.pie(mark,explode=explode,shadow=True,labels=sub,colors=colors,autopct="%1.
      ↪1f%%",radius=1.5)
      plt.show()
```

[62]:



```
[64]: explode = (0.4,0.3,0,0)
      colors = ['c','y','r','g']
      plt.pie(mark,explode=explode,shadow=True,labels=sub,colors=colors,autopct="%1.
      ↪1f%%",radius=0.7)
      plt.show()
```

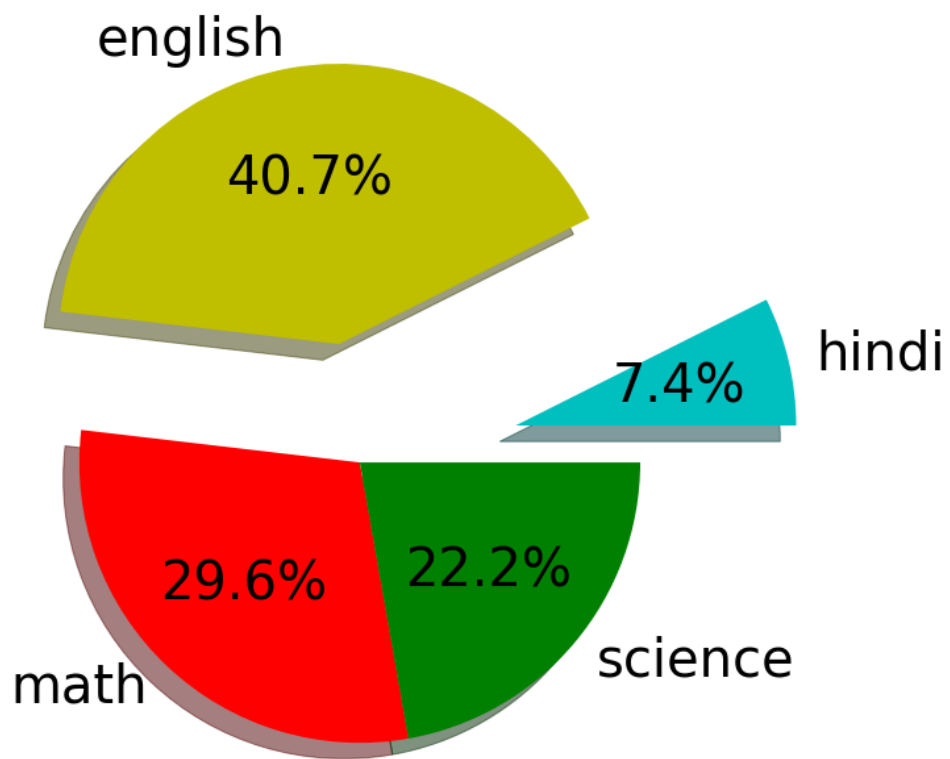
[64]:



TEXTPROPS() FUNCTION :- TO INCREASE/DECREASE TEXT SIZE

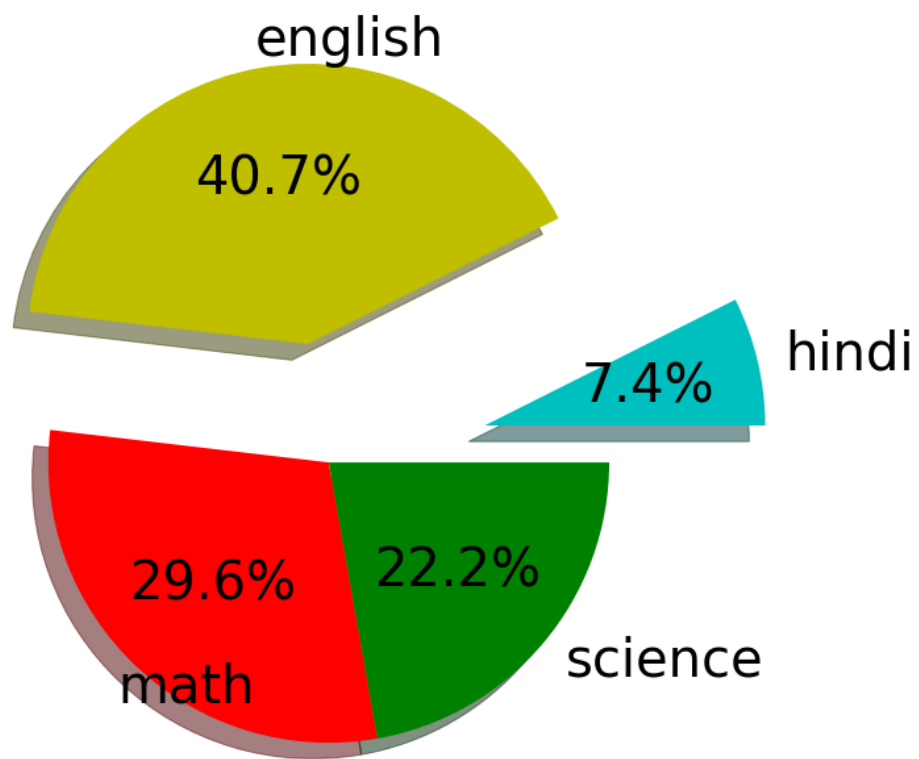
```
[67]: explode = (0.4,0.3,0,0)
      textprops = {'fontsize':20}
      colors = ['c','y','r','g']
      plt.pie(mark,explode=explode,shadow=True,labels=sub,colors=colors,autopct="%1.
      ↪1f%%",radius=0.7,textprops=textprops)
      plt.show()
```

[67]:



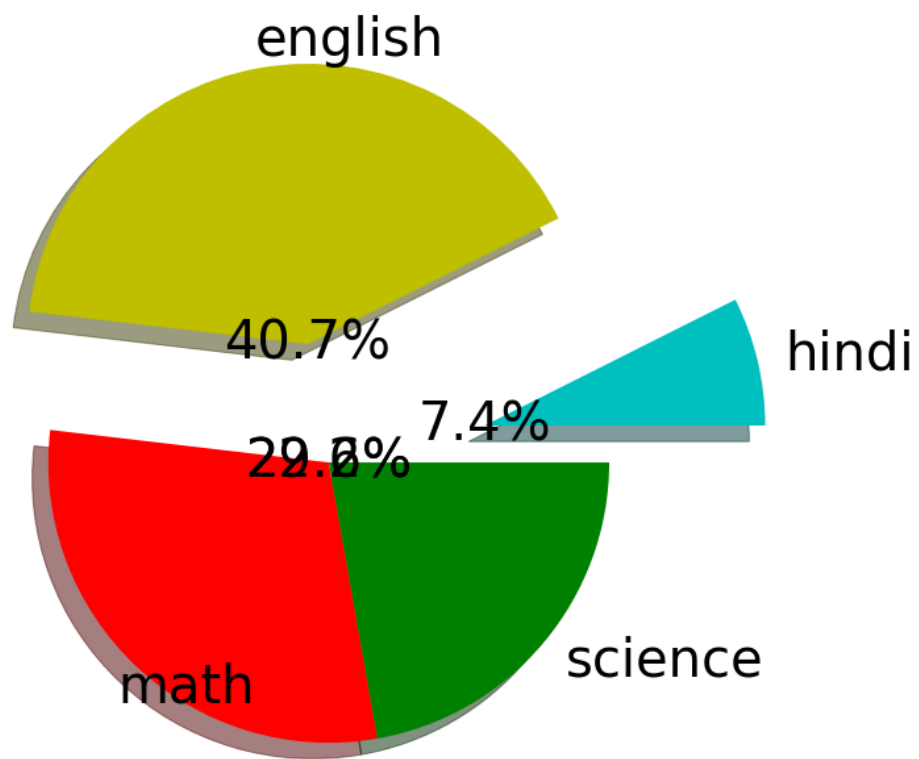
```
[83]: explode = (0.4,0.3,0,0)
      textprops = {'fontsize':20}
      colors = ['c','y','r','g']
      plt.pie(mark,explode=explode,shadow=True,labels=sub,colors=colors,autopct="%1.
      ↪1f%%",radius=0.7,textprops=textprops,
              center=(3,5))
      plt.show()
```

[83]:



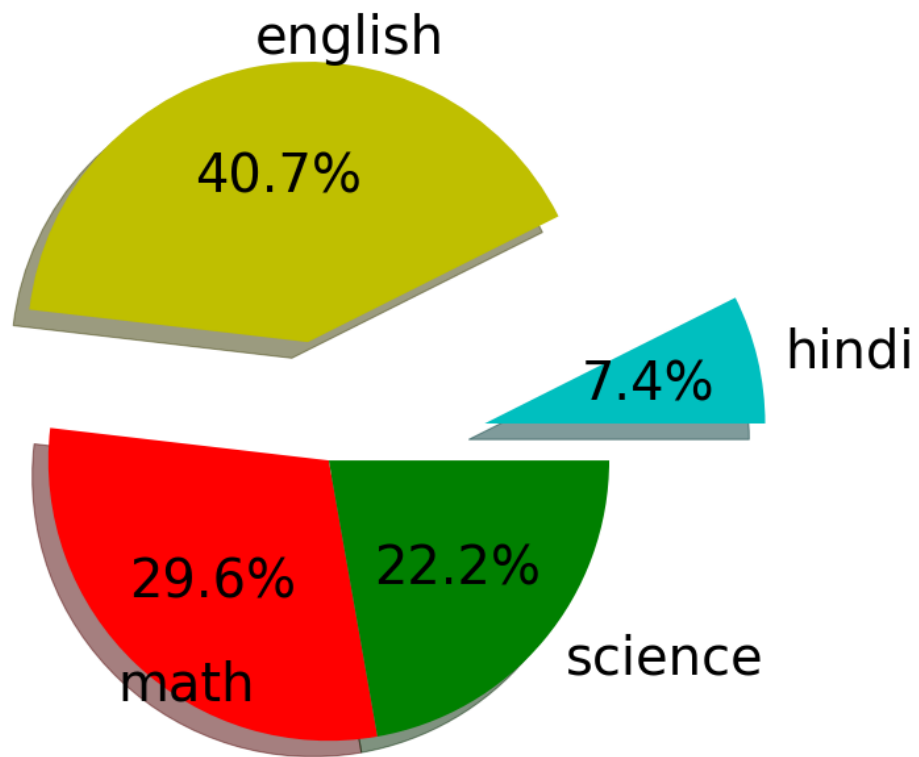
```
[79]: explode = (0.4,0.3,0,0)
textprops = {'fontsize':20}
colors = ['c','y','r','g']
plt.pie(mark,explode=explode,shadow=True,labels=sub,colors=colors,autopct="%1.
↪1f%%",radius=0.7,textprops=textprops,
        center=(3,5),pctdistance=0)
plt.show()
```

[79]:



```
[78]: explode = (0.4,0.3,0,0)
textprops = {'fontsize':20}
colors = ['c','y','r','g']
plt.pie(mark,explode=explode,shadow=True,labels=sub,colors=colors,autopct="%1.
↪1f%%",radius=0.7,textprops=textprops,
        center=(3,5),pctdistance=0.6)
plt.show()
```

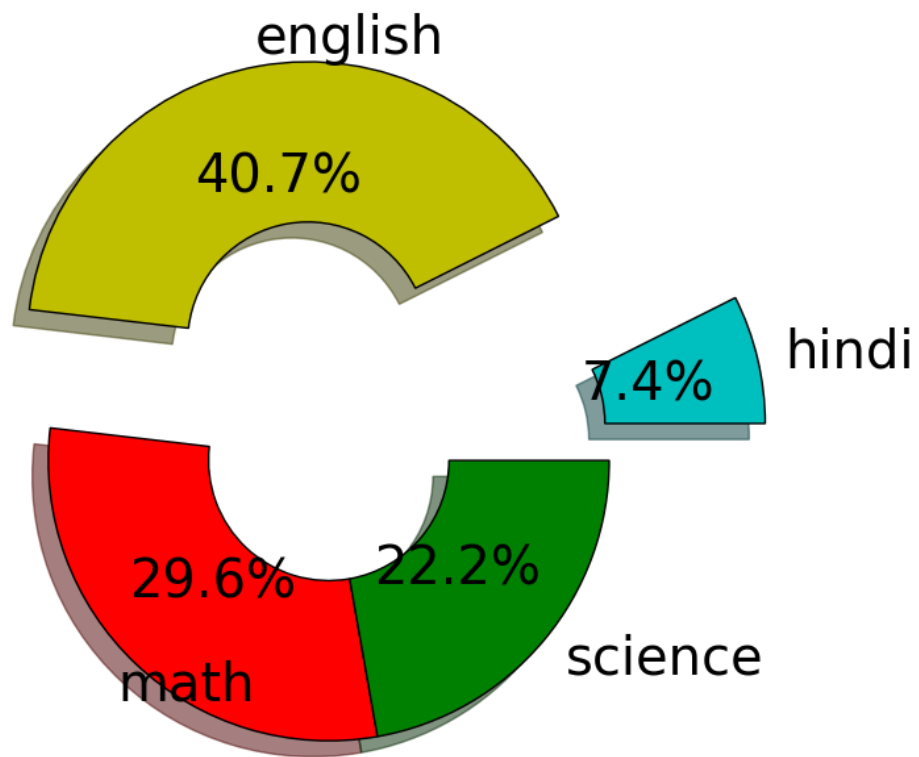
[78]:



BASE PROPERTY

```
[80]: explode = (0.4,0.3,0,0)
      wedgeprops = {'linewidth':0.7,'width':0.4,'edgecolor':'k'}
      textprops = {'fontsize':20}
      colors = ['c','y','r','g']
      plt.pie(mark,explode=explode,shadow=True,labels=sub,colors=colors,autopct="%1.
      ↪1f%%",radius=0.7,textprops=textprops,
              center=(3,5),pctdistance=0.6,wedgeprops=wedgeprops)
      plt.show()
```

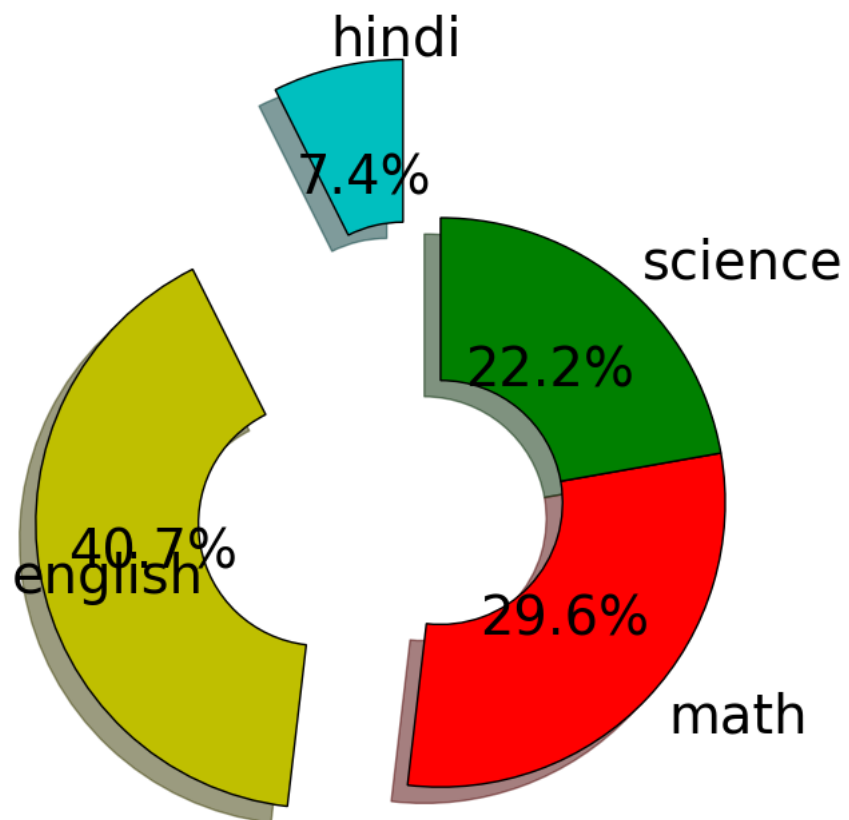
[80]:



START ANGLE

```
[81]: explode = (0.4,0.3,0,0)
wedgeprops = {'linewidth':0.7,'width':0.4,'edgecolor':'k'}
textprops = {'fontsize':20}
colors = ['c','y','r','g']
plt.pie(mark,explode=explode,shadow=True,labels=sub,colors=colors,autopct="%1.
↪1f%%",radius=0.7,textprops=textprops,
        center=(3,5),pctdistance=0.6,wedgeprops=wedgeprops,startangle=90)
plt.show()
```

[81]:



```
[82]: explode = (0.4,0.3,0,0)
wedgeprops = {'linewidth':0.7,'width':0.4,'edgecolor':'k'}
textprops = {'fontsize':20}
colors = ['c','y','r','g']
plt.pie(mark,explode=explode,shadow=True,labels=sub,colors=colors,autopct="%1.
→1f%%",radius=0.7,textprops=textprops,
        center=(3,5),pctdistance=0.6,wedgeprops=wedgeprops,startangle=120)
plt.show()
```

[82]:

