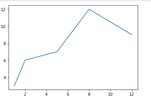
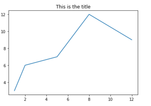
In [3]:
```
import matplotlib.pyplot as plt
```

In [4]:
```
import numpy as np
X = np.array([1,2,5,8,12])
Y = np.array([3,6,7,12,9])
import matplotlib.pyplot as plt
plt.plot(X, Y)
plt.show()
```



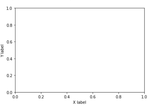
In [10]:
```
import numpy as np

K = np.array([1, 2, 5, 8, 12])
Y = np.array([3, 6, 7, 12, 9])

import matplotlib.pyplot as plt
plt.plot(K, Y)
plt.title("This is the title")
```

Out[10]:
```
Text(0.5, 1.0, 'This is the title')
```



In [11]:
```
plt.xlabel("X label")
plt.ylabel("Y label")
```

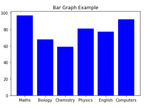
Out[11]:
```
Text(0, 0.5, 'Y label')
```



In [15]:
```
plt.show()
```

In [20]:
```
import matplotlib.pyplot as plt
subjects = ["Maths", "Biology", "Chemistry", "Physics", "English", "Computers"]
marks = [87, 68, 59, 81, 77, 92]
plt.bar(subjects, marks, color='blue')
plt.title("Bar Graph Example")
plt.xlable("Subjects")
plt.ylable("Marks")
plt.show()
```

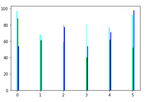
```
---------------------------------------------------------------------------
AttributeError                            Traceback (most recent call last)
<ipython-input-20-f16f6943366b> in <module>
      4 plt.bar(subjects, marks, color='blue')
      5 plt.title("Bar Graph Example")
----> 6 plt.xlable("Subjects")
      7 plt.ylable("Marks")
      8 plt.show()

AttributeError: module 'matplotlib.pyplot' has no attribute 'xlable'
```



In [25]:
```
import matplotlib.pyplot as plt
import numpy as np
subjects = ["Maths", "Biology", "Chemistry", "Physics", "English", "Computers"]
student1 = [87, 68, 59, 81, 77, 92]
student2 = [88, 61, 80, 40, 62, 52]
student3 = [54, 62, 77, 64, 71, 98]
index = np.arange(6)
width = 0.03
```

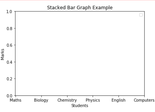
In [26]:
```
plt.bar(index, student1, width, color="aqua", label="Student 1")
plt.bar(index + width, student2, width, color="green", label="Student 2")
plt.bar(index + (width*2), student3, width, color="blue", label="Student 3")
```

Out[26]:
```
<BarContainer object of 6 artists>
```

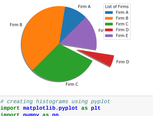


In [28]:
```
plt.title("Stacked Bar Graph Example")
plt.xlabel("Students")
plt.ylabel("Marks")
plt.xticks(index + width/2, subjects)
plt.legend()
plt.show()
```

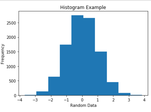
```
No handles with labels found to put in legend.
```



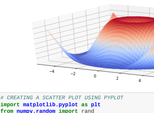
In [36]:
```
# creating pie charts using pyplot
import matplotlib.pyplot as plt
firms = ["Firm A", "Firm B", "Firm C", "Firm D", "Firm E"]
market_shares = [16, 40, 30, 5, 15]
Explode =[0,0,0,0.5,0]
plt.pie(market_shares, explode=Explode, labels=firms, shadow=True, startangle=45)
plt.axis('equal')
plt.legend(title = "List of Firms")
plt.show()
```



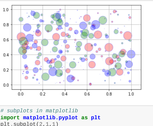
In [40]:
```
# creating histogram using pyplot
import matplotlib.pyplot as plt
import numpy as np
x = np.random.randn(10000)
plt.title("Histogram Example")
plt.xlabel("Random Data")
plt.ylabel("Frequency")
plt.hist(x, 10)
plt.show()
```



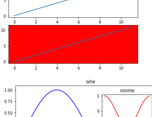
In [44]:
```
# CREATING 3D PROJECTIONS
from mpl_toolkits.mplot3d import Axes3D
import numpy as np
import matplotlib.pyplot as plt
import matplotlib
x = np.linspace(-5, 5, 50)
y = np.linspace(-5, 5, 50)
X, Y = np.meshgrid(x, y)
R = np.sqrt(X**2 + Y**2)
Z = np.sin(R)
figure = plt.figure(1, figsize = (12, 4))
subplot3d = plt.subplot(111, projection='3d')
surface = subplot3d.plot_surface(X, Y, Z, rstride=1, cstride=1, cmap=matplotlib.cm.coolwarm,
linewidth=0.1)
plt.show()
```

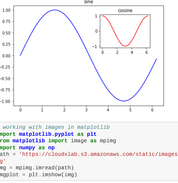


In [49]:
```
# CREATING A SCATTER PLOT USING PYPLOT
import matplotlib.pyplot as plt
from numpy.random import rand
for color in ['red', 'green', 'blue']:
    n = 100
    x, y = rand(2, n)
    scale = 500.0 * rand(n) ** 5
    plt.scatter(x, y, s=scale, c=color, alpha=0.3, edgecolors='blue')

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

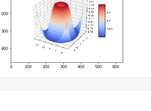


In [6]:
```
# subplots in matplotlib
import matplotlib.pyplot as plt
plt.subplot(2,1,1)
plt.plot(range(12))
plt.subplot(2,1,2, facecolor='red')
plt.plot(range(12))
plt.show()
import numpy as np
import math
x = np.arange(0, math.pi*2, 0.09)
fig=plt.figure()
axes1 = fig.add_axes([0.1, 0.1, 0.9, 0.9])
axes2 = fig.add_axes([0.62, 0.62, 0.3, 0.3])
y = np.sin(x)
axes1.plot(x, y, 'b')
axes2.plot(x,np.cos(x),'r')
axes1.set_title('sine')
axes2.set_title("cosine")
plt.show()
```





In [10]:
```
# working with images in matplotlib
import matplotlib.pyplot as plt
from matplotlib import image as mpimg
import numpy as np
path = 'https://cloudxlab.s3.amazonaws.com/static/images/aha/matplotlib/introduction_image.png'
img = mpimg.imread(path)
imgplot = plt.imshow(img)
```



In [ ]:
```

```