matplotlip

July 5, 2024

[ ]:
```
Is useful for making plots
```

[1]:
```
import matplotlib.pyplot as plt
```

[2]:
```
#import numpy to get some value
import numpy as np
```

[7]:
```
x = np.linspace(0,10,100)   #x=angle
#this function give data, from the script it will give evenly space 100 values␣
 ↪between 1 and 10
y = np.sin(x)    #y = sin
z = np.cos(x)    #z = cos
```

[8]:
```
print(x)
```

```
[ 0.         0.1010101  0.2020202  0.3030303  0.4040404  0.50505051
  0.60606061 0.70707071 0.80808081 0.90909091 1.01010101 1.11111111
  1.21212121 1.31313131 1.41414141 1.51515152 1.61616162 1.71717172
  1.81818182 1.91919192 2.02020202 2.12121212 2.22222222 2.32323232
  2.42424242 2.52525253 2.62626263 2.72727273 2.82828283 2.92929293
  3.03030303 3.13131313 3.23232323 3.33333333 3.43434343 3.53535354
  3.63636364 3.73737374 3.83838384 3.93939394 4.04040404 4.14141414
  4.24242424 4.34343434 4.44444444 4.54545455 4.64646465 4.74747475
  4.84848485 4.94949495 5.05050505 5.15151515 5.25252525 5.35353535
  5.45454545 5.55555556 5.65656566 5.75757576 5.85858586 5.95959596
  6.06060606 6.16161616 6.26262626 6.36363636 6.46464646 6.56565657
  6.66666667 6.76767677 6.86868687 6.96969697 7.07070707 7.17171717
  7.27272727 7.37373737 7.47474747 7.57575758 7.67676768 7.77777778
  7.87878788 7.97979798 8.08080808 8.18181818 8.28282828 8.38383838
  8.48484848 8.58585859 8.68686869 8.78787879 8.88888889 8.98989899
  9.09090909 9.19191919 9.29292929 9.39393939 9.49494949 9.5959596
  9.6969697  9.7979798  9.8989899  10.        ]
```

[9]:
```
print(y)
```

```
[ 0.         0.10083842 0.20064886 0.2984138  0.39313661 0.48385164
  0.56963411 0.64960951 0.72296256 0.78894546 0.84688556 0.8961922
  0.93636273 0.96698762 0.98775469 0.99845223 0.99897117 0.98930624
  0.96955595 0.93992165 0.90070545 0.85230712 0.79522006 0.73002623
```

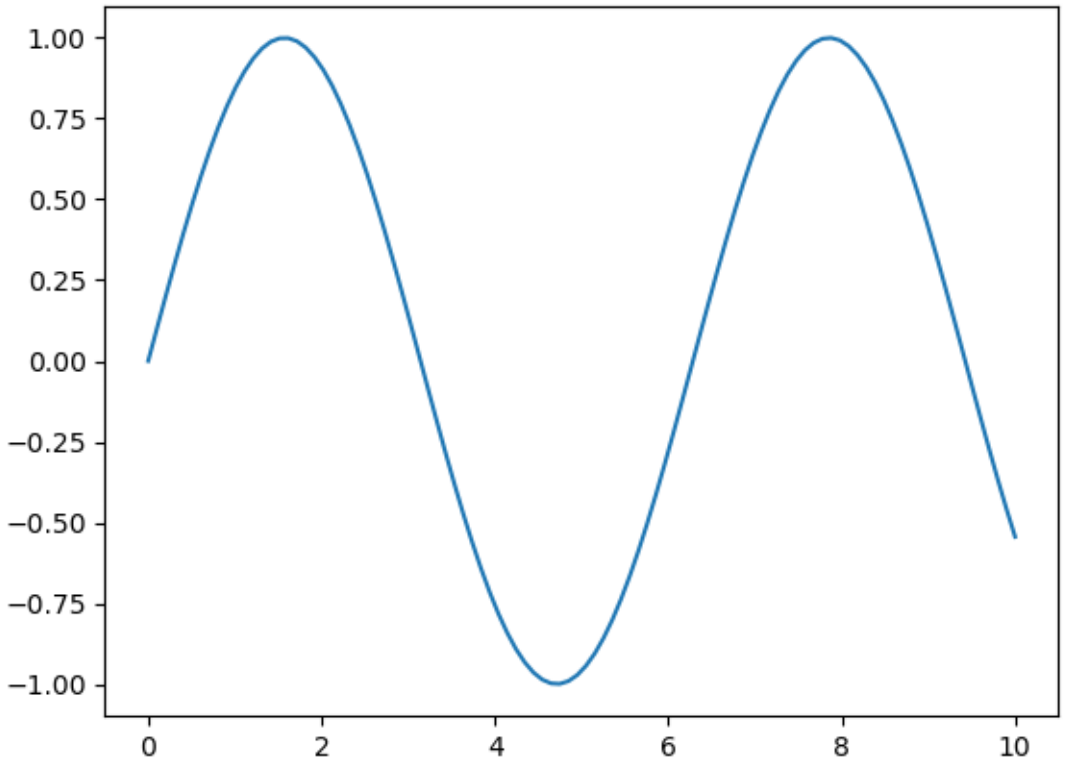
```
 0.65739025  0.57805259  0.49282204  0.40256749  0.30820902  0.21070855
 0.11106004  0.01027934 -0.09060615 -0.19056796 -0.28858706 -0.38366419
-0.47483011 -0.56115544 -0.64176014 -0.7158225  -0.7825875  -0.84137452
-0.89158426 -0.93270486 -0.96431712 -0.98609877 -0.99782778 -0.99938456
-0.99075324 -0.97202182 -0.94338126 -0.90512352 -0.85763861 -0.80141062
-0.73701276 -0.66510151 -0.58640998 -0.50174037 -0.41195583 -0.31797166
-0.22074597 -0.12126992 -0.0205576   0.0803643   0.18046693  0.27872982
 0.37415123  0.46575841  0.55261747  0.63384295  0.7086068   0.77614685
 0.83577457  0.8868821   0.92894843  0.96154471  0.98433866  0.99709789
 0.99969234  0.99209556  0.97438499  0.94674118  0.90944594  0.86287948
 0.8075165   0.74392141  0.6727425   0.59470541  0.51060568  0.42130064
 0.32770071  0.23076008  0.13146699  0.03083368 -0.07011396 -0.17034683
-0.26884313 -0.36459873 -0.45663749 -0.54402111]
```

[10]:
```
print(z)
```

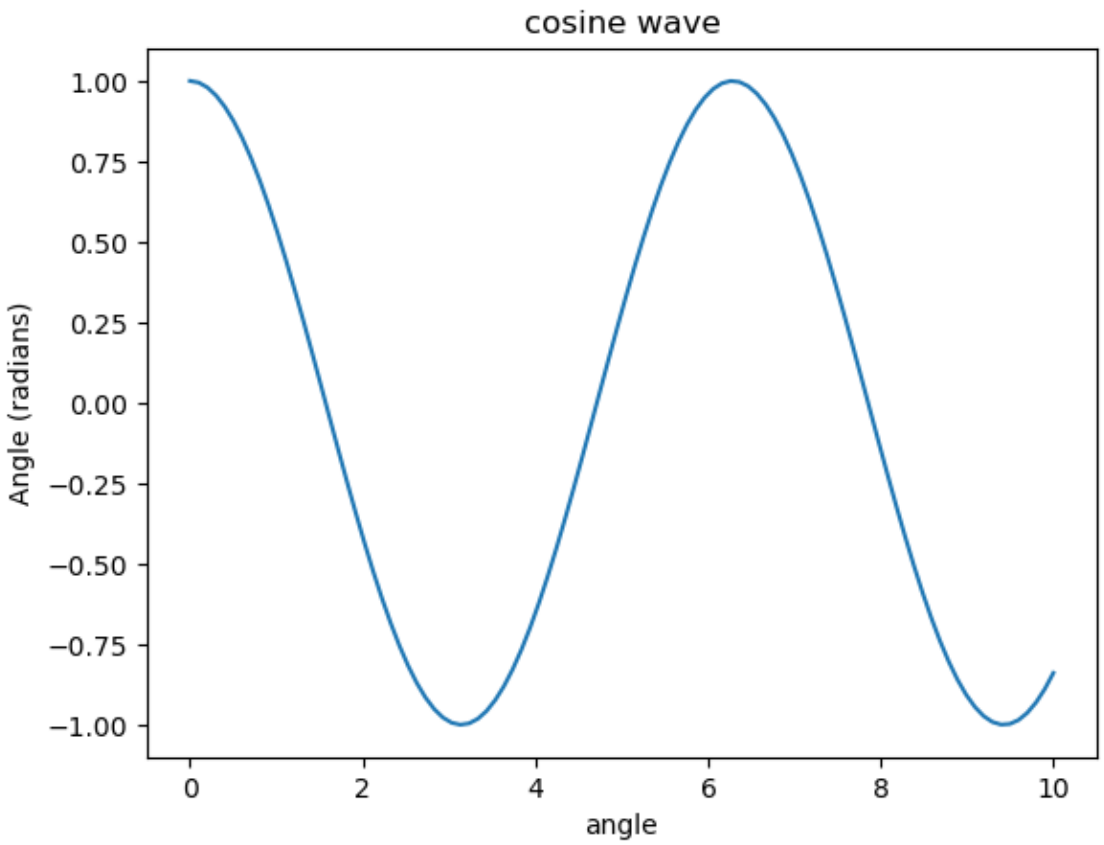
```
[ 1.          0.99490282  0.97966323  0.95443659  0.91948007  0.87515004
  0.8218984   0.76026803  0.69088721  0.61446323  0.53177518  0.44366602
  0.35103397  0.25482335  0.15601496  0.0556161  -0.04534973 -0.14585325
 -0.24486989 -0.34139023 -0.43443032 -0.52304166 -0.60632092 -0.68341913
 -0.75355031 -0.81599952 -0.87013012 -0.91539031 -0.95131866 -0.97754893
 -0.9938137  -0.99994717 -0.9958868  -0.981674   -0.95745366 -0.92347268
 -0.88007748 -0.82771044 -0.76690542 -0.69828229 -0.6225406  -0.54045251
 -0.45285485 -0.36064061 -0.26474988 -0.16616018 -0.06587659  0.03507857
  0.13567613  0.23489055  0.33171042  0.4251487   0.51425287  0.59811455
  0.67587883  0.74675295  0.8100144   0.86501827  0.91120382  0.94810022
  0.97533134  0.99261957  0.99978867  0.99676556  0.98358105  0.96036956
  0.9273677   0.88491192  0.83343502  0.77346177  0.70560358  0.63055219
  0.54907273  0.46199582  0.37020915  0.27464844  0.17628785  0.07613012
 -0.0248037  -0.12548467 -0.2248864  -0.32199555 -0.41582217 -0.50540974
 -0.58984498 -0.66826712 -0.7398767  -0.8039437  -0.859815   -0.90692104
 -0.94478159 -0.97301068 -0.99132055 -0.99952453 -0.99753899 -0.98538417
 -0.96318398 -0.93116473 -0.88965286 -0.83907153]
```

Ploting the data

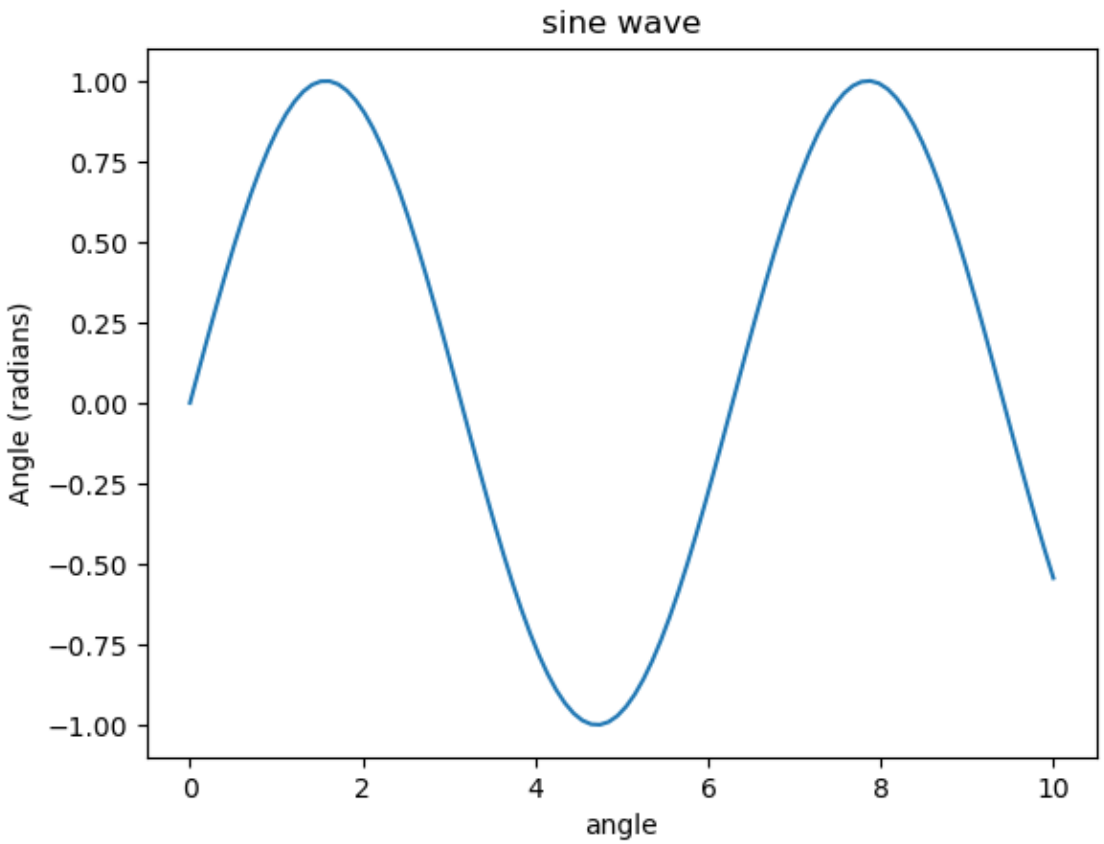
[12]:
```
#sine wave
plt.plot(x,y)
plt.show()
```



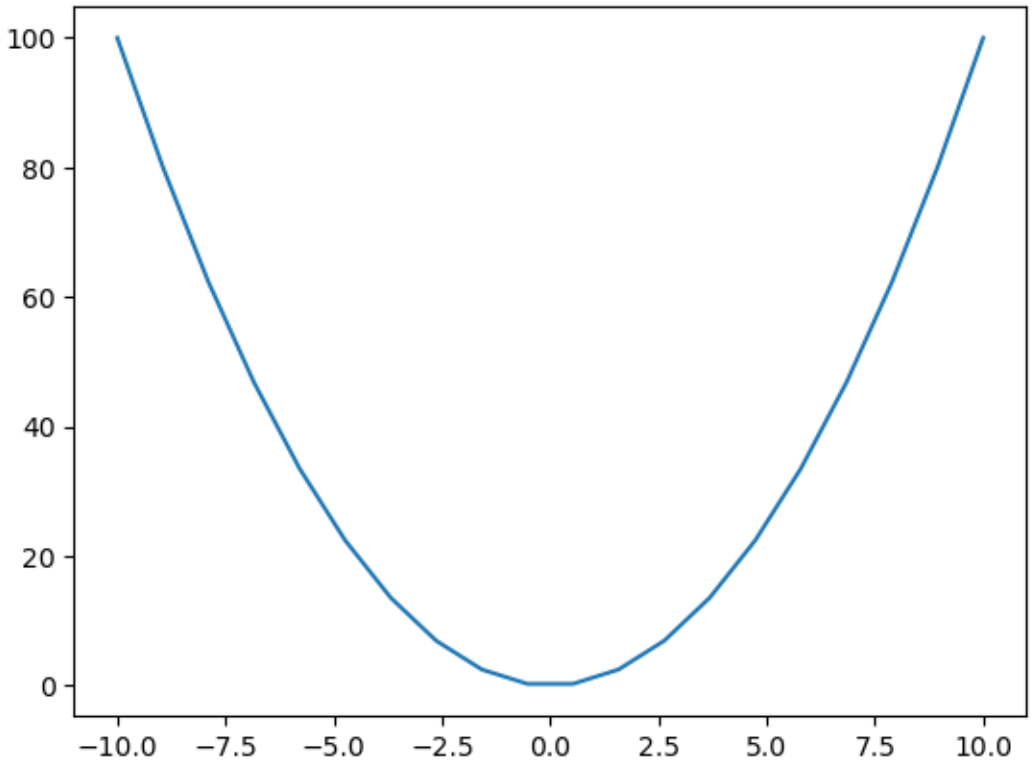
[36]:
```
#cosine wave
plt.plot(x,z)
plt.xlabel('angle')
plt.ylabel('Angle (radians)')
plt.title('cosine wave')
plt.show()
```



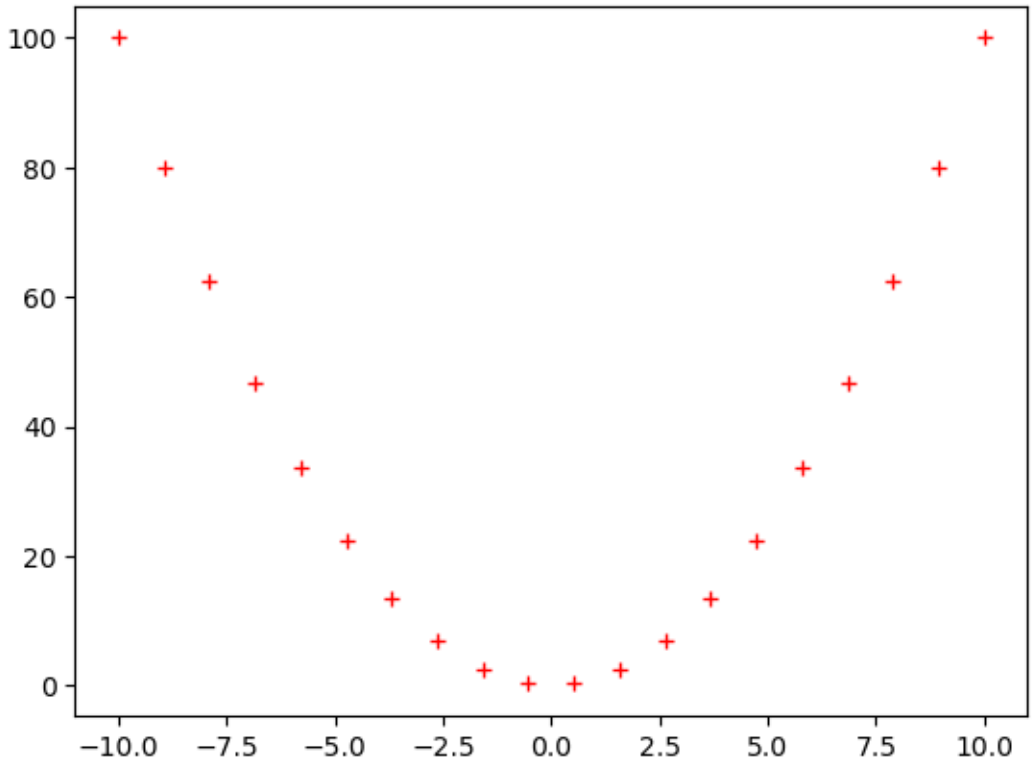
[29]:
```
#Adding tittle x= axis, y = axis

plt.plot(x,y)
plt.xlabel('angle')
plt.ylabel('Angle (radians)')
plt.title('sine wave')
plt.show();
```



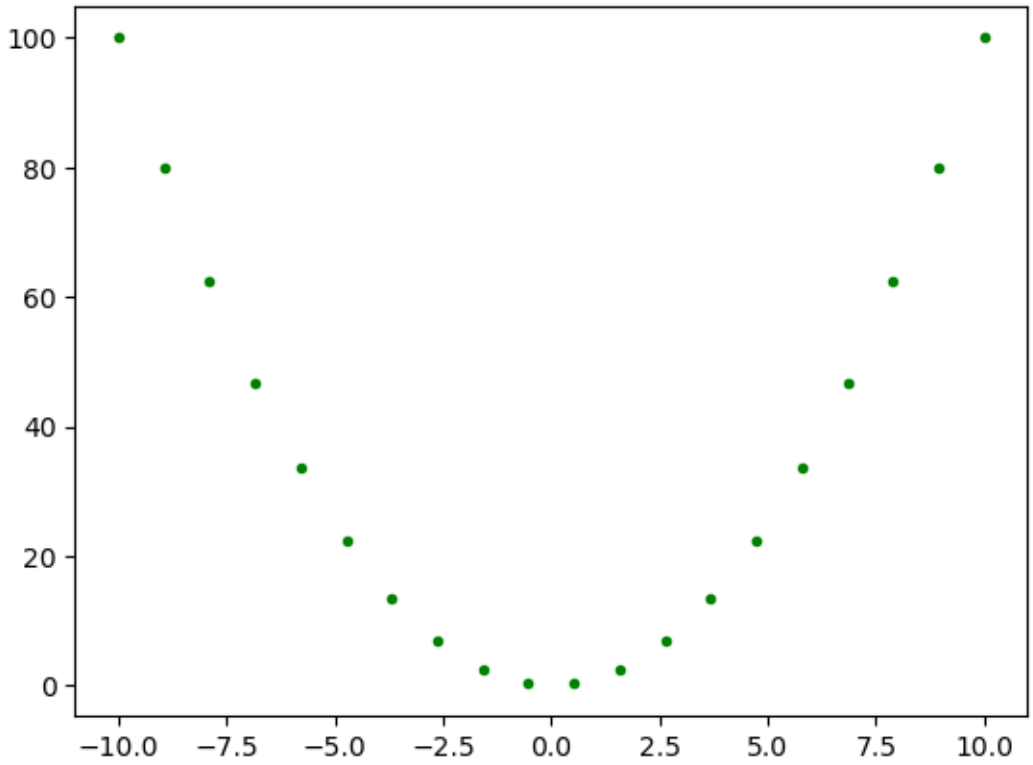
[40]:
```
#parabola
x = np.linspace(-10, 10, 20)
y = x**2
plt.plot(x,y)
plt.show()
```



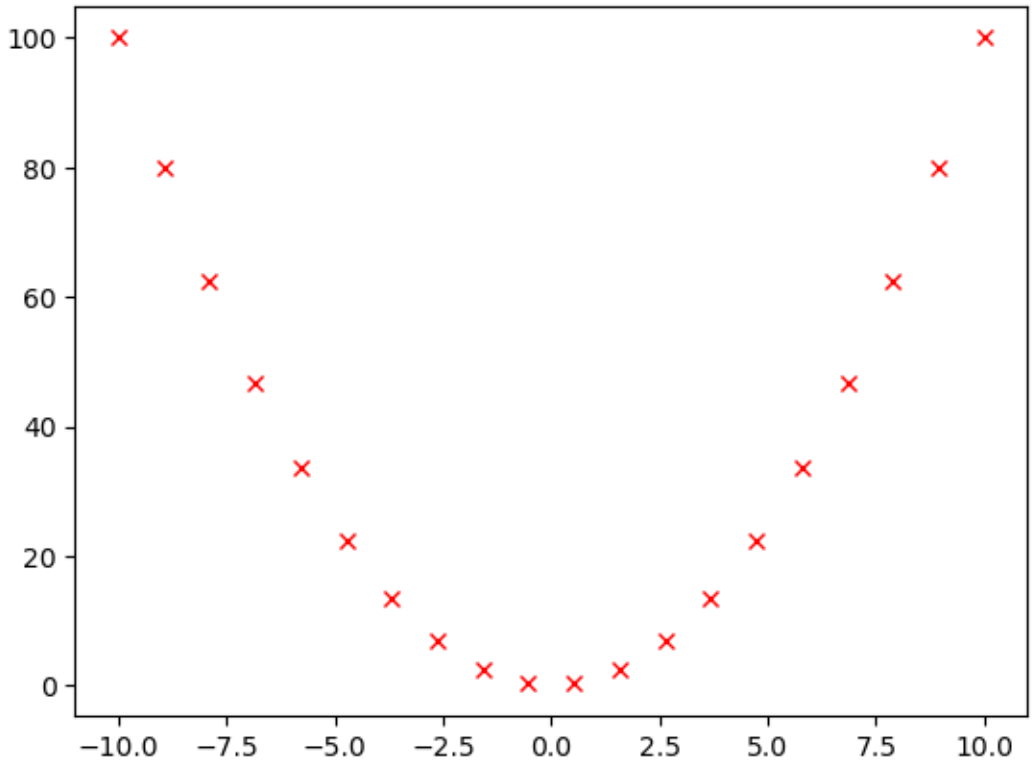
[42]:
```
plt.plot(x, y, 'r+')
plt.show()
```



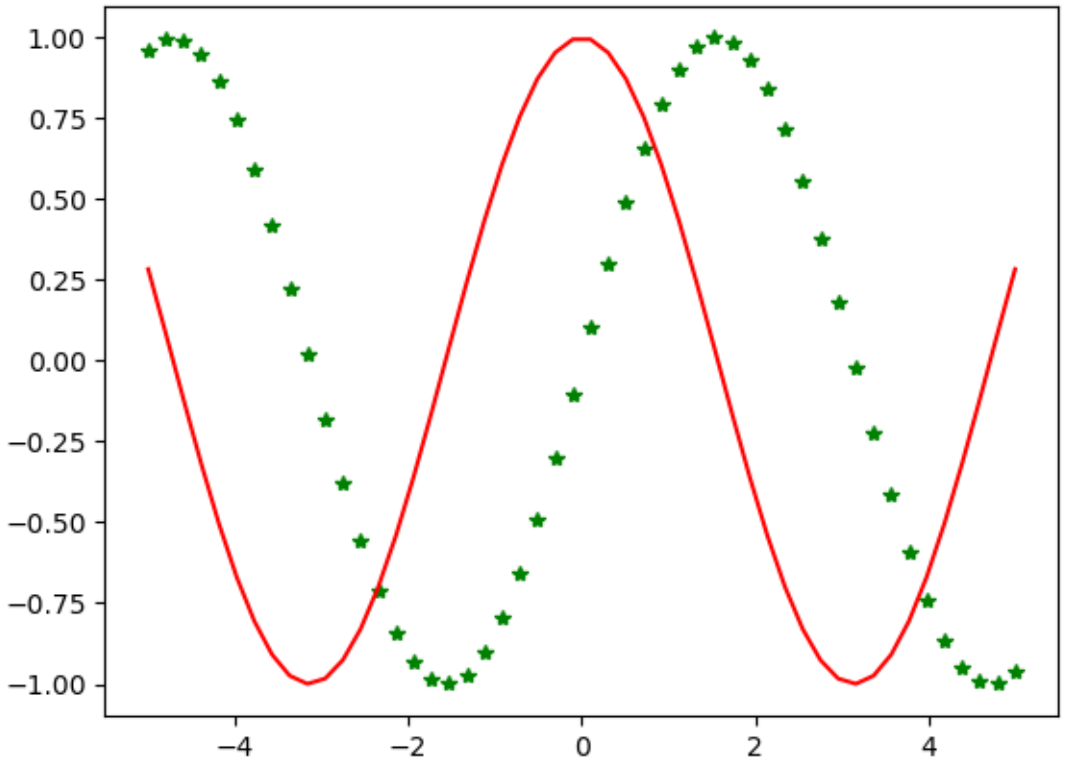
[44]:
```
plt.plot(x, y, 'g.')
plt.show()
```



[46]:
```
plt.plot(x, y, 'rx')
plt.show()
```

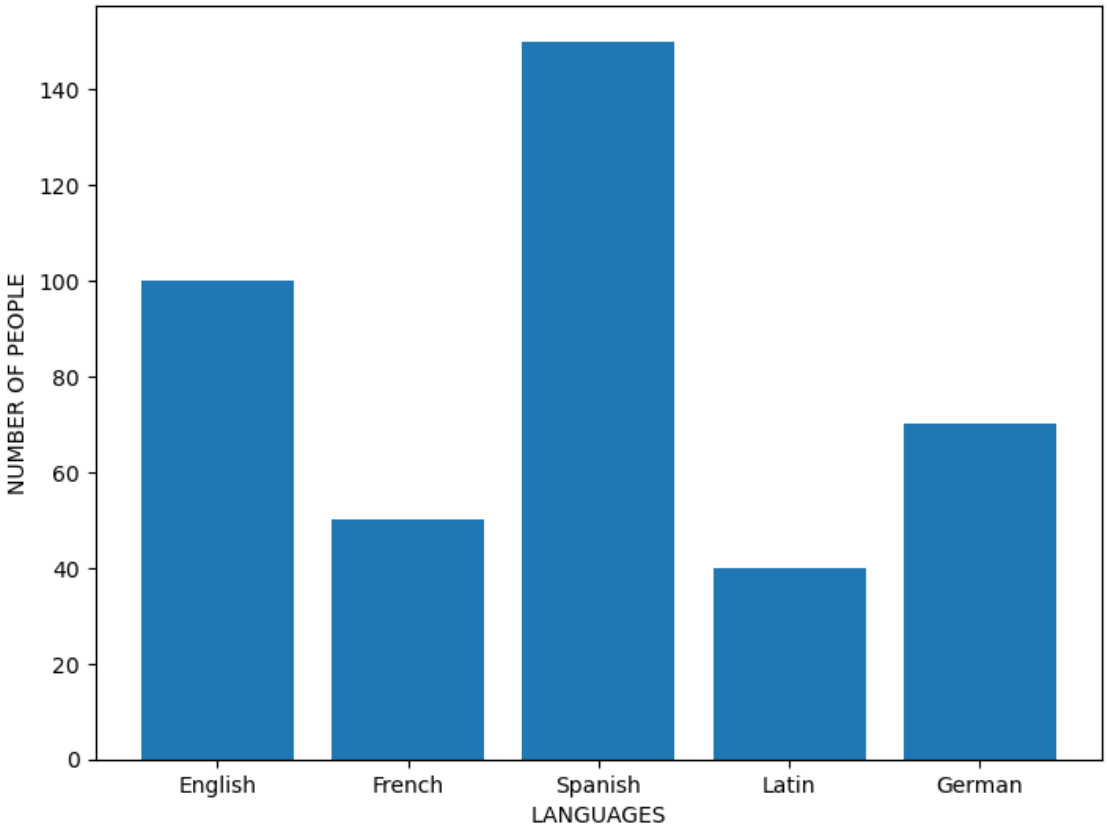


[60]:
```
x = np.linspace(-5, 5, 50)
plt.plot(x, np.sin(x), 'g*')
plt.plot(x, np.cos(x) ,'r')
plt.show()
```



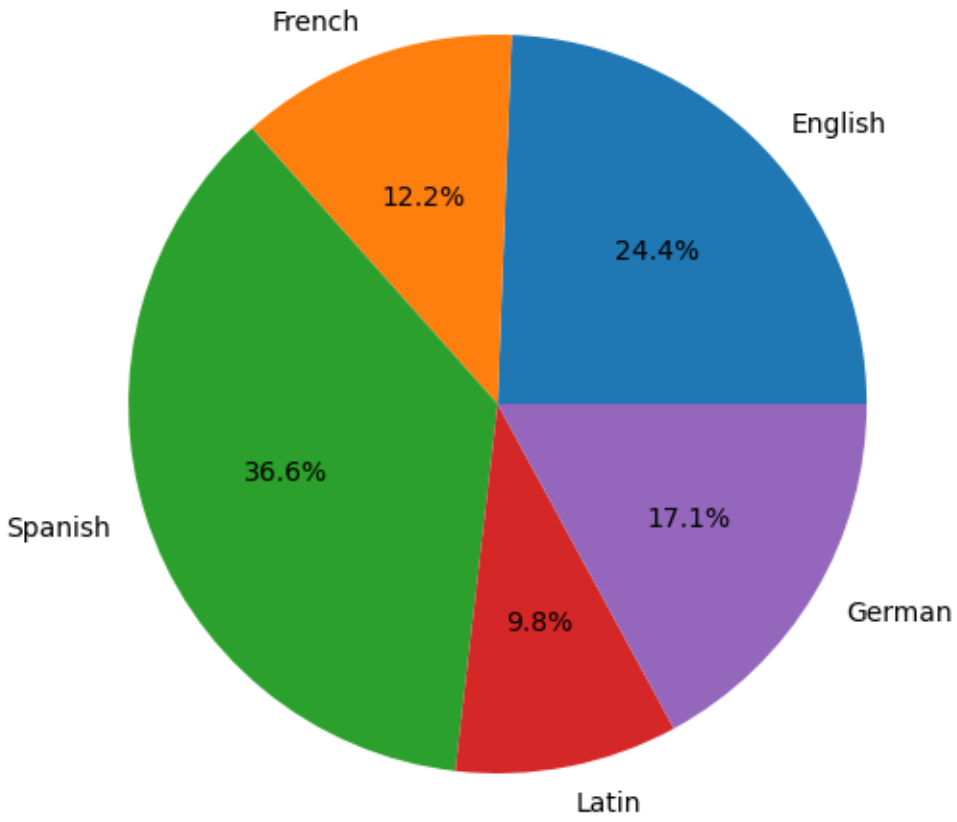
BAR PLOT

[64]:
```
fig = plt.figure()
ax = fig.add_axes([0,0,1,1])
#0 and 0 rpresents the cordinates ie the origin
#1 and 1 reps the rectagle
languages = ['English', 'French', 'Spanish', 'Latin', 'German']
people = [100, 50, 150, 40, 70]

ax.bar(languages, people)
plt.xlabel('LANGUAGES')
plt.ylabel('NUMBER OF PEOPLE')
plt.show()
```



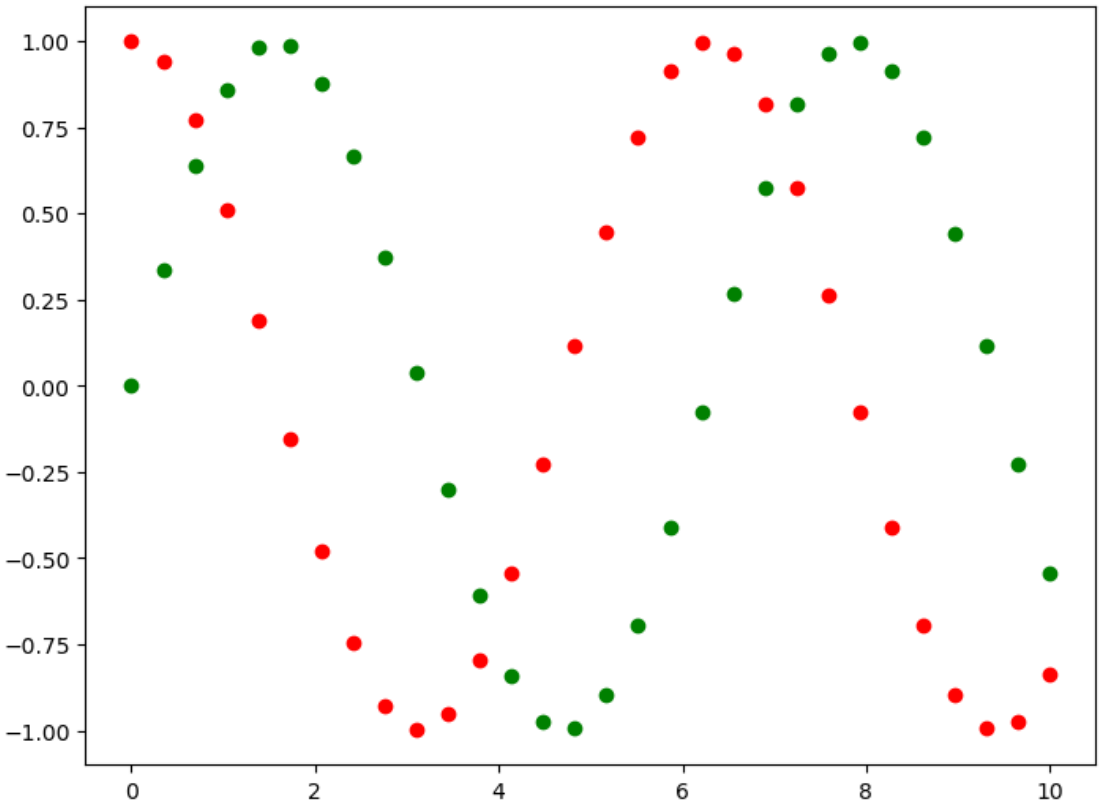
PIE CHART Is used to find the distribution of the data

[71]:
```
fig1 = plt.figure()
ax = fig1.add_axes([0,0,1,1])

languages = ['English', 'French', 'Spanish', 'Latin', 'German']
people = [100, 50, 150, 40, 70]

ax.pie(people, labels = languages, autopct = '%1.1f%%')
plt.show()
```



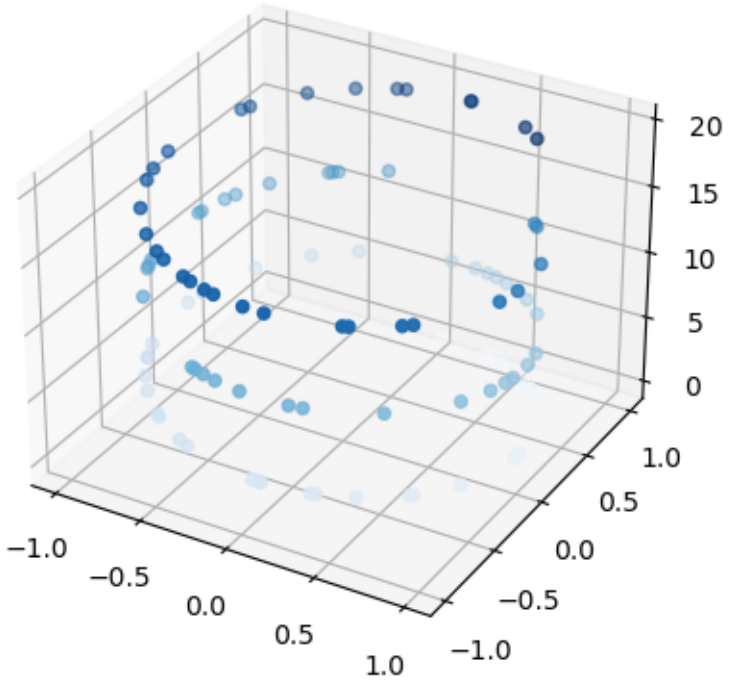
SCATTER PLOT

[75]:
```
x = np.linspace(0,10,30)
y = np.sin(x)
z = np.cos(x)
fig2 = plt.figure()
ax = fig2.add_axes([0,0,1,1])
ax.scatter(x,y, color = 'g')
ax.scatter(x,z, color = 'r')
plt.show()
```



3D SCATTER PLOT

[79]:
```
fig3 = plt.figure()
ax = plt.axes(projection = '3d')
z = 20 * np.random.random(100)
x = np.sin(z)
y = np.cos(z)
ax.scatter(x,y,z, c =z, cmap = 'Blues')
plt.show()
```


20
15
10
5
0
1.0
0.5
0.0
−0.5
−1.0
−1.0
−0.5
0.0
0.5
1.0

[ ]: