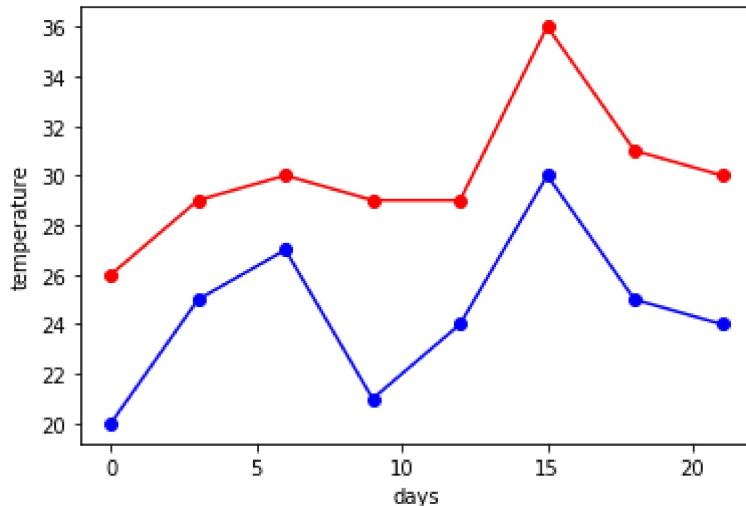


# 1\_

```
In [1]: import matplotlib  
print(matplotlib.__version__)
```

```
In [2]: import matplotlib.pyplot as plt  
import numpy as np  
days=list(range(0,22,3))  
temp=[20,25,27,21,24,30,25,24]  
plt.scatter(days,temp)  
plt.show()
```

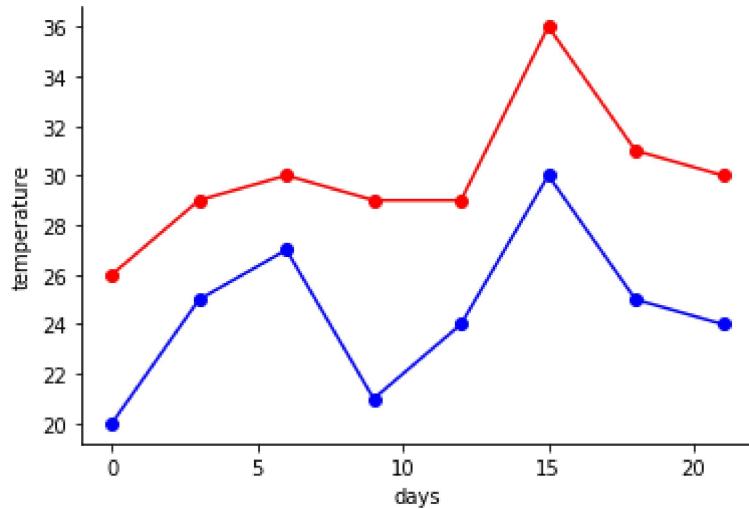
```
In [3]: days=list(range(0,22,3))  
temp=[20,25,27,21,24,30,25,24]  
plt.plot(days,temp, 'b')  
plt.plot(days,temp, 'ob')  
temp2=[26,29,30,29,29,36,31,30]  
plt.plot(days,temp2, 'r')  
plt.plot(days,temp2, 'or')  
plt.xlabel('days')  
plt.ylabel('temperature')  
plt.show()
```



# 2\_

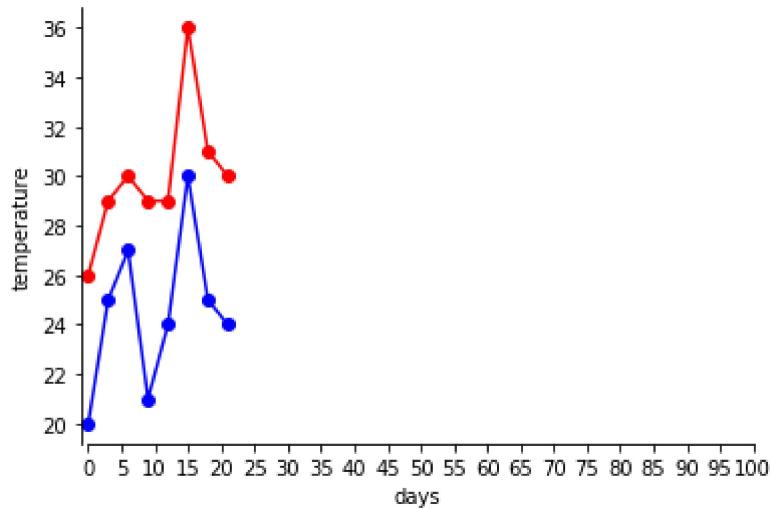
```
In [4]: days=list(range(0,22,3))
temp=[20,25,27,21,24,30,25,24]
plt.plot(days,temp, 'b')
plt.plot(days,temp, 'ob')
temp2=[26,29,30,29,29,36,31,30]
plt.plot(days,temp2, 'r')
plt.plot(days,temp2, 'or')
plt.xlabel('days')
plt.ylabel('temperature')

ax=plt.gca()
ax.spines['right'].set_visible(False)
ax.spines['top'].set_visible(False)
```



```
In [5]: days=list(range(0,22,3))
temp=[20,25,27,21,24,30,25,24]
plt.plot(days,temp, 'b')
plt.plot(days,temp, 'ob')
temp2=[26,29,30,29,29,36,31,30]
plt.plot(days,temp2, 'r')
plt.plot(days,temp2, 'or')
plt.xlabel('days')
plt.ylabel('temperature')
```

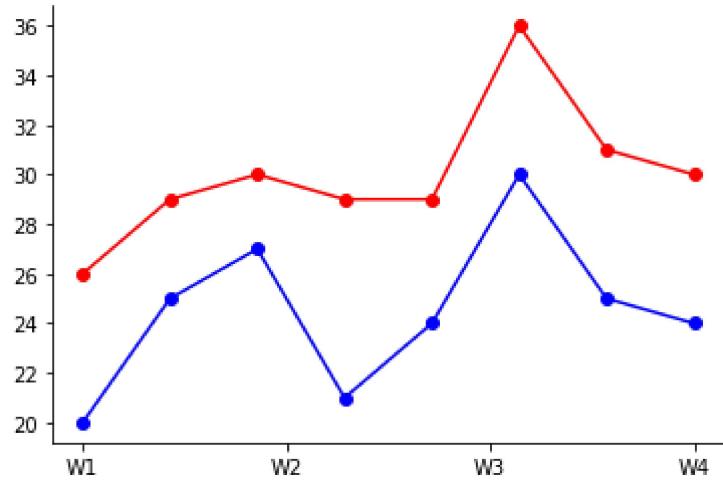
```
ax=plt.gca()
ax.spines['right'].set_visible(False)
ax.spines['top'].set_visible(False)
ax.spines['bottom'].set_bounds(0,100)
plt.xticks(range(0,101,5))
plt.show()
```



```
In [6]: plt.plot(days,temp,'b')
plt.plot(days,temp,'ob')
plt.plot(days,temp2,'r')
plt.plot(days,temp2,'or')

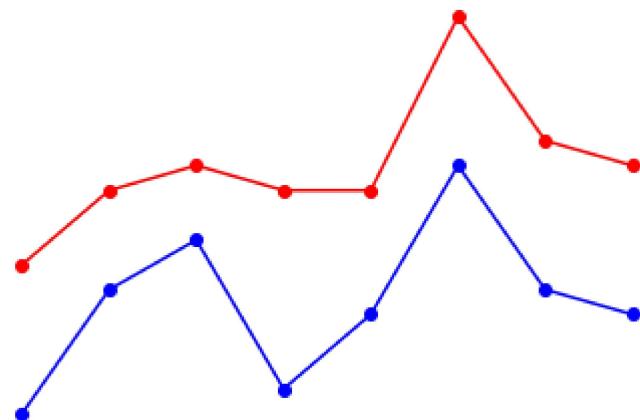
ax=plt.gca()
ax.spines['right'].set_visible(False)
ax.spines['top'].set_visible(False)

plt.xticks(range(0,28,7),['W1','W2','W3','W4'])
plt.show()
```

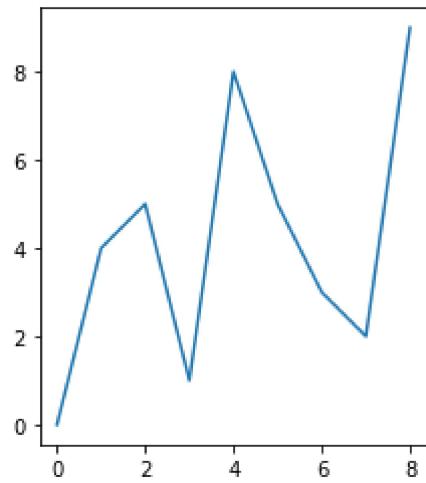


```
In [7]: plt.plot(days,temp,'b')
plt.plot(days,temp,'ob')
plt.plot(days,temp2,'r')
plt.plot(days,temp2,'or')

plt.axis('off')
plt.show()
```



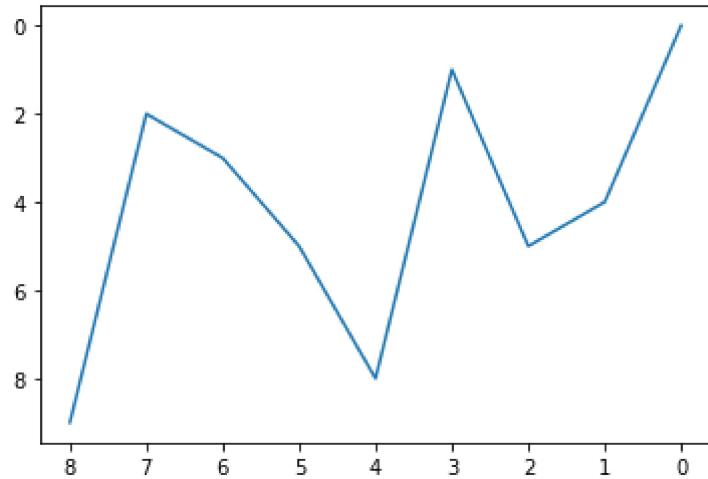
```
In [8]: x=[0,1,2,3,4,5,6,7,8]
y=[0,4,5,1,8,5,3,2,9]
plt.axes().set_aspect('equal')
plt.plot(x,y)
plt.show()
```



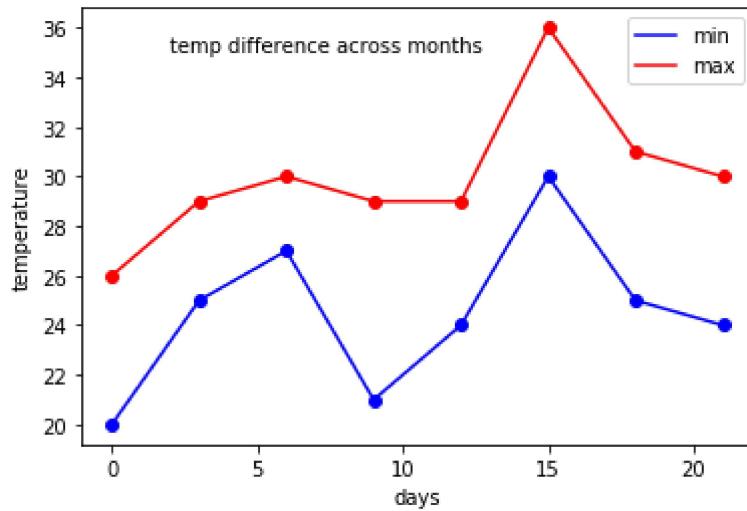
```
In [9]: x=[0,1,2,3,4,5,6,7,8]
y=[0,4,5,1,8,5,3,2,9]
plt.axes().invert_yaxis()
plt.axes().invert_xaxis()
plt.plot(x,y)
plt.show()
```

C:\ProgramData\Anaconda3\lib\site-packages\ipykernel\_launcher.py:4: MatplotlibDeprecationWarning: Adding an axes using the same arguments as a previous axes currently reuses the earlier instance. In a future version, a new instance will always be created and returned. Meanwhile, this warning can be suppressed, and the future behavior ensured, by passing a unique label to each axes instance.

after removing the cwd from sys.path.



```
In [10]: plt.plot(days,temp,'b',label='min')
plt.plot(days,temp,'ob')
plt.plot(days,temp2,'r',label='max')
plt.plot(days,temp2,'or')
plt.xlabel('days')
plt.ylabel('temperature')
plt.legend(loc='best')
plt.annotate('temp difference across months',xy=(2,35))
plt.show()
```



### 3

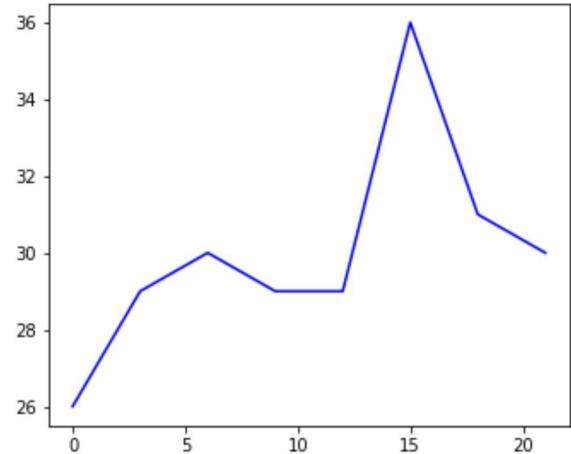
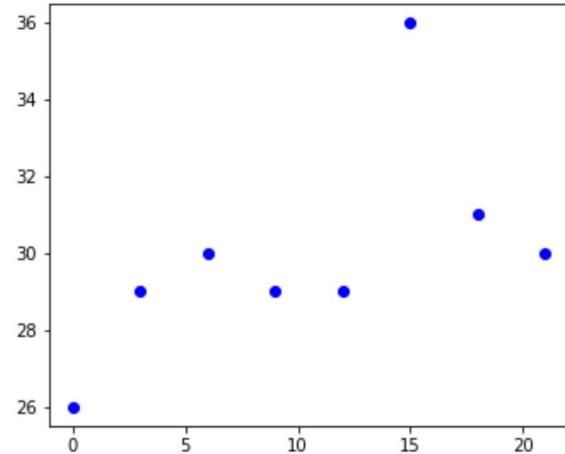
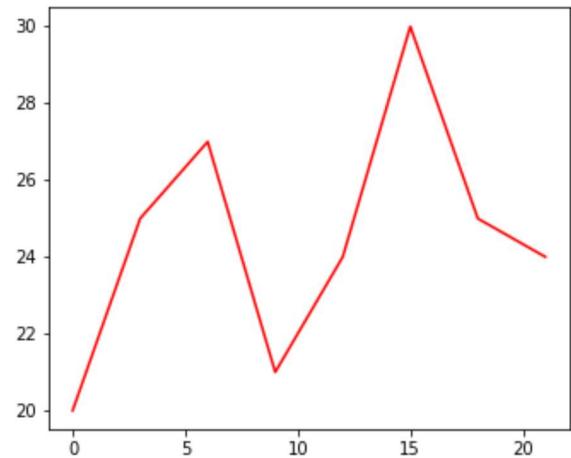
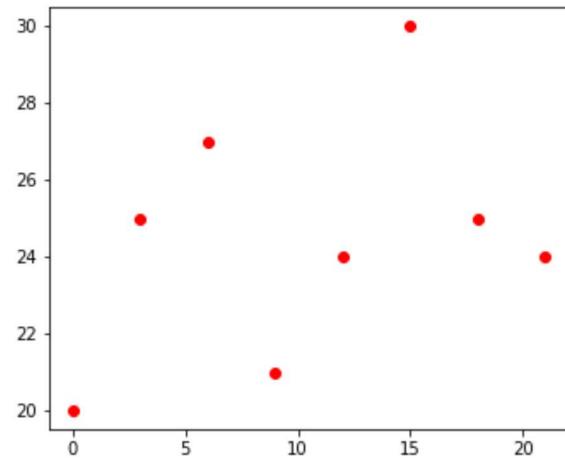
```
In [11]: temp=[20,25,27,21,24,30,25,24]
temp2=[26,29,30,29,29,36,31,30]
```

```
In [12]: plt.figure(figsize=[12,10])
```

```
sub1=plt.subplot(2,2,1)
sub2=plt.subplot(2,2,2)
sub3=plt.subplot(2,2,3)
sub4=plt.subplot(2,2,4)

sub1.plot(days,temp, 'or')
sub2.plot(days,temp, 'r')

sub3.plot(days,temp2, 'ob')
sub4.plot(days,temp2, 'b')
plt.show()
```

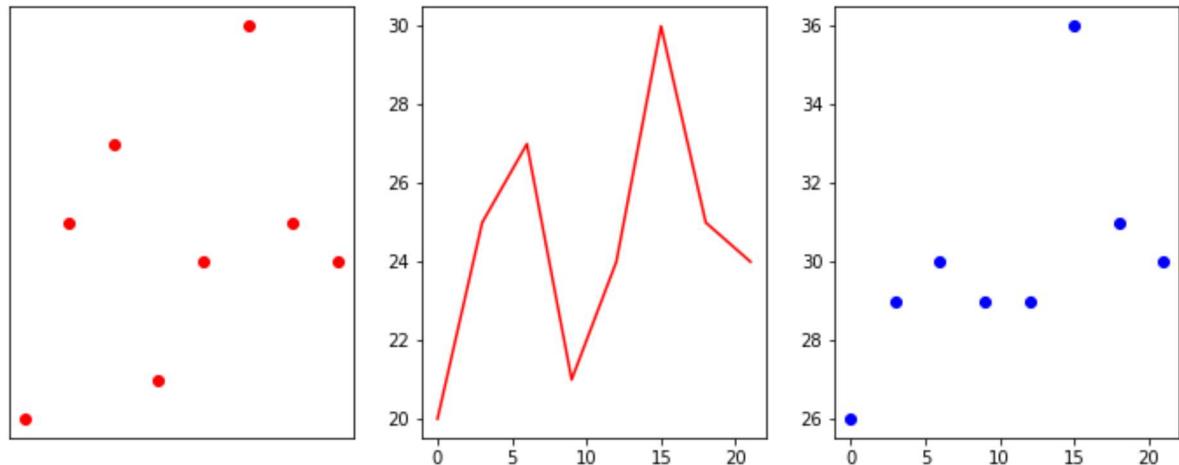


```
In [13]: plt.figure(figsize=[12,10])
```

```
sub1=plt.subplot(2,3,1)
sub1.set_xticks(())
sub1.set_yticks(())
sub2=plt.subplot(2,3,2)
sub3=plt.subplot(2,3,3)
sub4=plt.subplot(2,3,5)

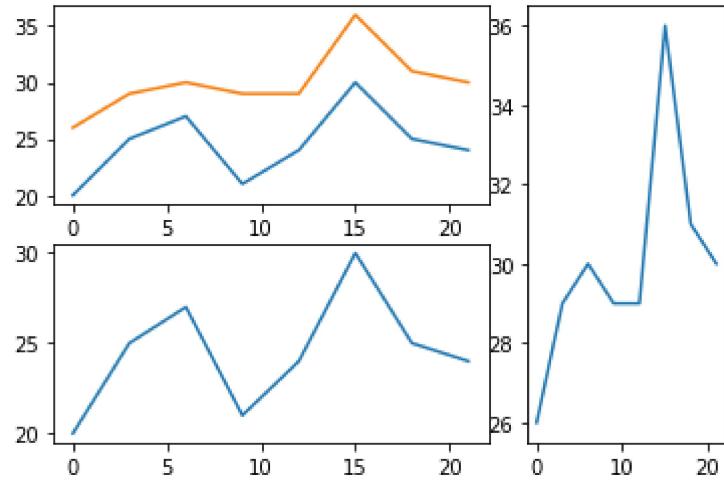
sub1.plot(days,temp, 'or')
sub2.plot(days,temp, 'r')

sub3.plot(days,temp2, 'ob')
sub4.plot(days,temp2, 'b')
plt.show()
```



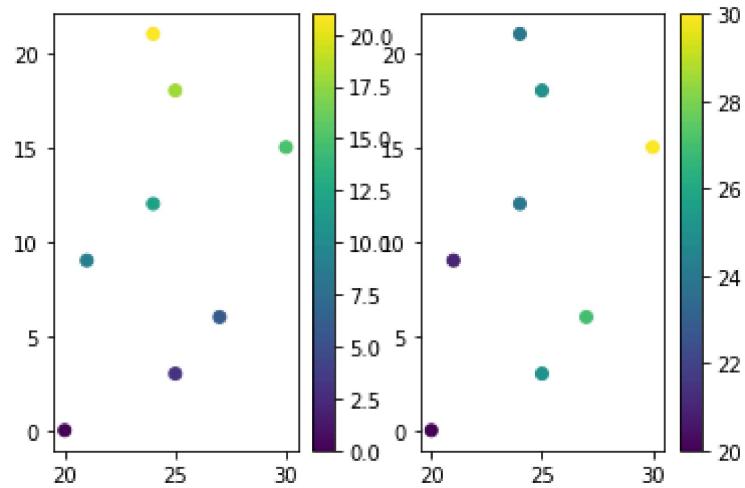
```
In [14]: import matplotlib.gridspec as gridspec
```

```
In [15]: gridspec.GridSpec(2,3) # 6 subplots
                           # number position span
s=plt.subplot2grid((2,3), (0,0), colspan=2, rowspan=1)
s.plot(days,temp)
plt.plot(days,temp2)
plt.subplot2grid((2,3), (1,0), colspan=2, rowspan=1)
plt.plot(days,temp)
plt.subplot2grid((2,3),(0,2),colspan=1, rowspan=2)
plt.plot(days,temp2)
plt.show()
```



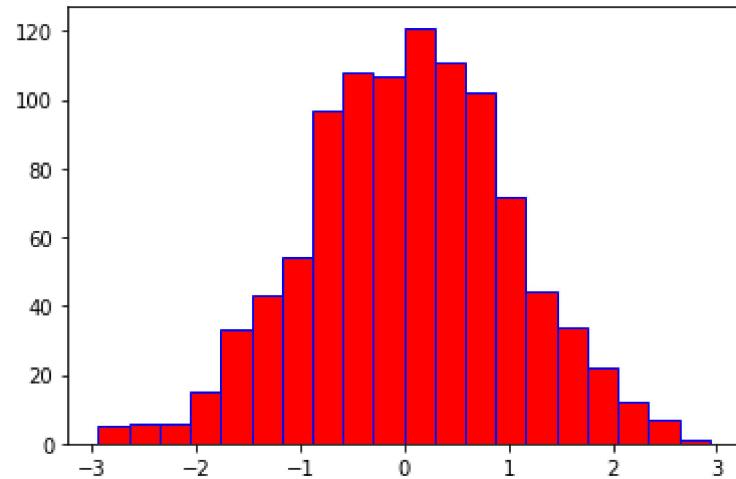
```
In [16]: plt.subplot(1,2,1)
pl=plt.scatter(temp,days,c=days)
plt.colorbar(pl)

plt.subplot(1,2,2)
pl=plt.scatter(temp,days,c=temp)
plt.colorbar(pl)
plt.show()
```



```
In [17]: gauss=np.random.normal(size=1000)
```

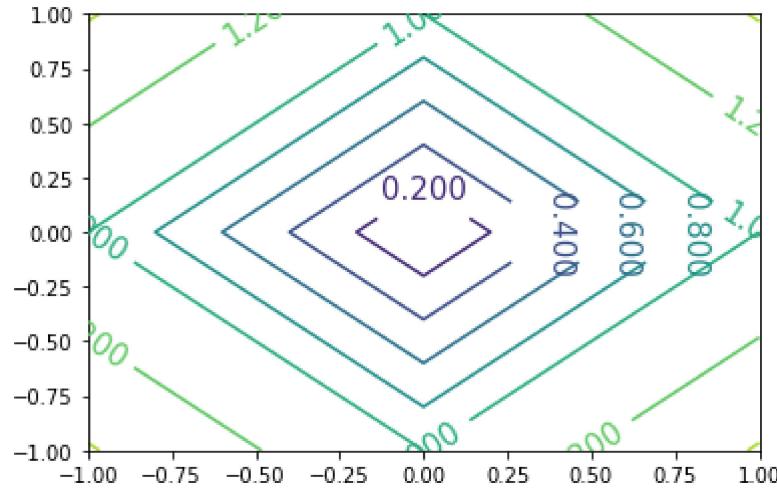
```
In [18]: plt.hist(gauss,bins=20,color='r',edgecolor='b')
plt.show()
```



```
In [19]: xlist=np.linspace(-1,1,3)
ylist=np.linspace(-1,1,3)
X,Y=np.meshgrid(xlist,ylist)
```

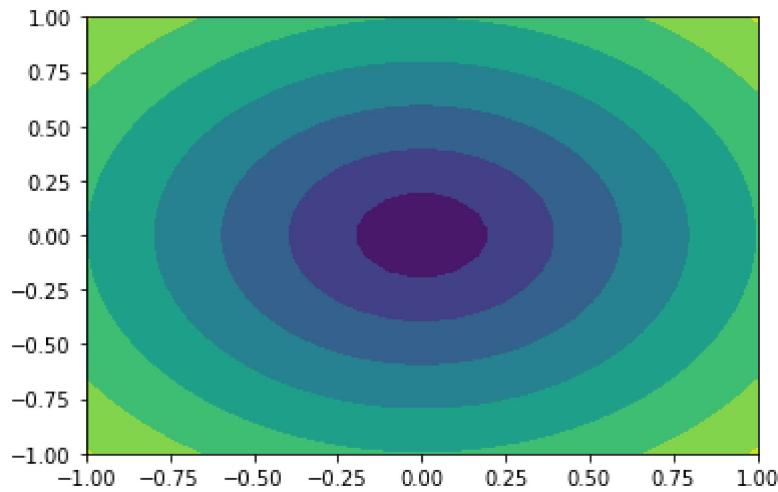
```
Z=np.sqrt(X*X+Y*Y)
cp=plt.contour(X,Y,Z)
plt.clabel(cp,fontsize=15)
```

Out[19]: <a list of 12 text.Text objects>



```
In [20]: xlist=np.linspace(-1,1,30)
ylist=np.linspace(-1,1,30)
X,Y=np.meshgrid(xlist,ylist)

Z=np.sqrt(X*X+Y*Y)
cp=plt.contourf(X,Y,Z)
```

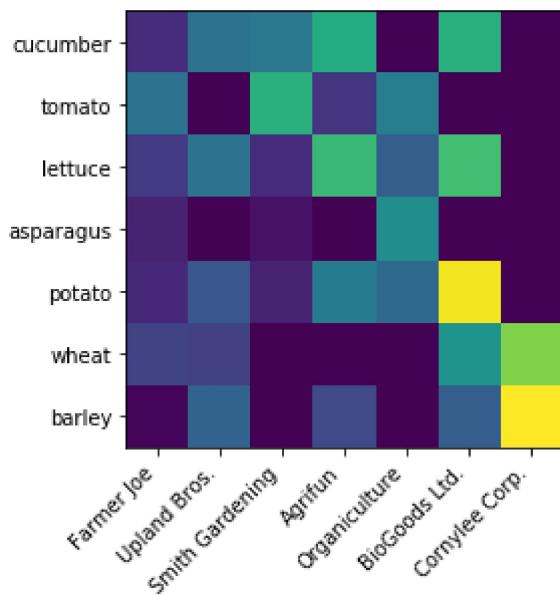


```
In [27]: vegetables = ["cucumber", "tomato", "lettuce", "asparagus",
                     "potato", "wheat", "barley"]
farmers = ["Farmer Joe", "Upland Bros.", "Smith Gardening",
           "Agrifun", "Organiculture", "BioGoods Ltd.", "Cornylee Corp."]

harvest = np.array([[0.8, 2.4, 2.5, 3.9, 0.0, 4.0, 0.0],
                   [2.4, 0.0, 4.0, 1.0, 2.7, 0.0, 0.0],
                   [1.1, 2.4, 0.8, 4.3, 1.9, 4.4, 0.0],
                   [0.6, 0.0, 0.3, 0.0, 3.1, 0.0, 0.0],
                   [0.7, 1.7, 0.6, 2.6, 2.2, 6.2, 0.0],
                   [1.3, 1.2, 0.0, 0.0, 0.0, 3.2, 5.1],
                   [0.1, 2.0, 0.0, 1.4, 0.0, 1.9, 6.3]])

fig, ax = plt.subplots()
im = ax.imshow(harvest)
ax.set_xticks(np.arange(len(farmers)))
ax.set_yticks(np.arange(len(vegetables)))
ax.set_xticklabels(farmers)
ax.set_yticklabels(vegetables)

plt.setp(ax.get_xticklabels(), rotation=45, ha="right")
plt.show()
```



## 5\_

```
In [29]: import cv2
print(cv2.__version__)
```

4.2.0

```
In [38]: img=cv2.imread('D:\Print Album\9-3-20 Ross Island\IMG20200309132314.jpg')
img
```

```
Out[38]: array([[[ 75, 114,  99],
   [ 37,  76,  61],
   [  0,  40,  25],
   ...,
   [205, 174, 141],
   [207, 175, 140],
   [209, 174, 140]],

  [[ 67, 106,  91],
   [  0,  28,  13],
   [  0,  34,  19],
   ...,
   [204, 173, 140],
   [204, 172, 137],
   [204, 169, 135]],

  [[ 55,  94,  79],
   [  6,  45,  30],
   [  0,  40,  25],
   ...,
   [204, 173, 140],
   [205, 173, 138],
   [204, 169, 135]],

  ...,

  [[[110, 129, 156],
   [114, 133, 160],
   [115, 134, 161],
   ...,
   [127, 180, 223],
   [126, 177, 220],
   [125, 176, 219]],

  [[[116, 137, 164],
   [110, 131, 158],
   [105, 126, 153],
   ...,
   [126, 177, 220],
   [125, 176, 219],
   [127, 178, 221]],

  [[[109, 130, 157],
   [101, 122, 149],
   [ 96, 117, 144],
   ...,
   [128, 179, 222],
   [125, 176, 219],
   [126, 177, 220]]], dtype=uint8)
```

```
In [42]: cropped_img=img[15000:25000,50000:70000]
cv2.imshow('frame',img)
cv2.waitKey(0) #BRG
```

Out[42]: -1

```
In [43]: plt.imshow(img)
```

Out[43]: <matplotlib.image.AxesImage at 0x1faa1af8e08>



```
In [45]: rgb=cv2.cvtColor(img,cv2.COLOR_BGR2RGB)
plt.imshow(rgb)
```

Out[45]: <matplotlib.image.AxesImage at 0x1fa9e066848>



```
In [48]: gray=cv2.cvtColor(rgb,cv2.COLOR_BGR2GRAY)
cv2.imshow('gray',gray)
cv2.waitKey(0)
```

Out[48]: -1

```
In [ ]:
```

In [51]: `pwd`

Out[51]: `'C:\\Users\\Ashray Shrivastava'`

In [ ]: