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In [ ]:
```
for i in range (1,6):
  print(i,':',i**2)
```

```
1 : 1
2 : 4
3 : 9
4 : 16
5 : 25
```

In [ ]:
```
import sympy
for i in range (1,6):
  if not sympy.isprime(i):
   print(i,':',i**2)
```

```
1 : 1
4 : 16
```

In [ ]:
```
squares = [i**2 for i in range (1,6)]
for i,i2 in enumerate(squares):
  print (i+1 , ':',i2)
```

```
1 : 1
2 : 4
3 : 9
4 : 16
5 : 25
```

In [ ]:
```
import sympy
squares = [i**2 for i in range(1,6)]
for i,i2 in enumerate(squares):
    if not sympy.isprime(i+1):
        print (i+1 , ':',(i+1)**2)
```

```
1 : 1
4 : 16
```

In [ ]:
```
import numpy as np
A = np.array([[1,2],[3,4],[5,6]])
B = np.array([[7,8,9,1],[1,2,3,4]])

print(np.dot(A,B))
```

```
[[ 9 12 15  9]
 [25 32 39 19]
 [41 52 63 29]]
```

In [ ]:
```
A =  [[1,2],[3,4],[5,6]]
B = [[3,2],[5,4],[3,1]]
C = np.multiply(A,B)
print (C)
```

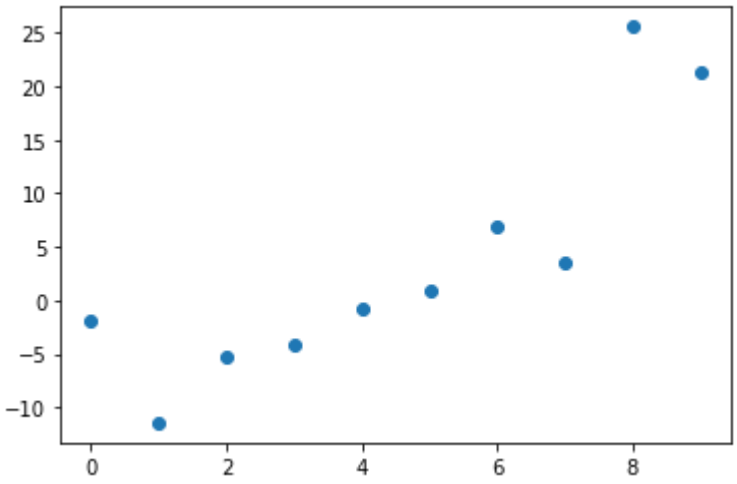
```
[[ 3  4]
 [15 16]
 [15  6]]
```

In [ ]:
```
a = np.random.randint(10, size = (5,7))
print(a )
print( )

print(a[1:4 , 0:2])
```

```
[[8 4 9 4 5 9 5]
 [4 5 3 8 0 5 3]
 [2 4 0 4 7 9 6]
 [1 3 4 0 6 3 9]
 [8 5 4 8 9 6 1]]

[[4 5]
 [2 4]
 [1 3]]
```

In [ ]:
```
import numpy as np
from numpy import linalg
import matplotlib.pyplot as plt
m, c = 2 , -4
N = 10
x = np.linspace (0 , N-1, N) . reshape (N, 1 )
sigma = 10
y = m*x + c + np . random. normal (0 , sigma , (N, 1 ) )
plt.scatter(x,y)

x = np.append(np.ones((N,1)),x, axis = 1)

w = linalg.inv(x.T@x)@x.T@y
print (w)
```

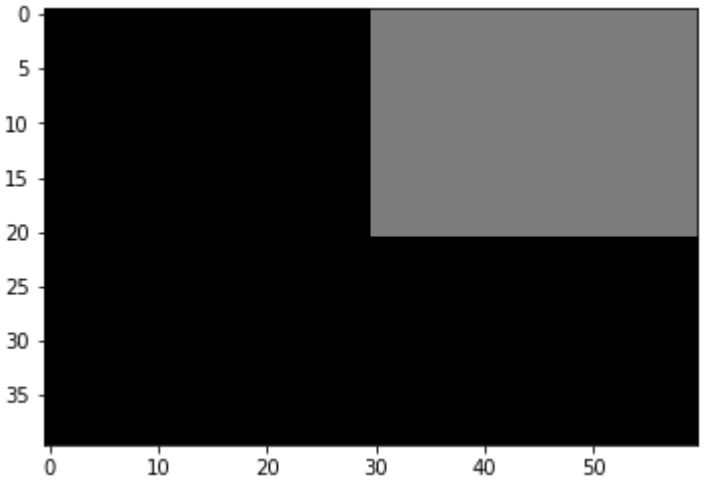
```
[[-11.53500984]
 [  3.32818341]]
```



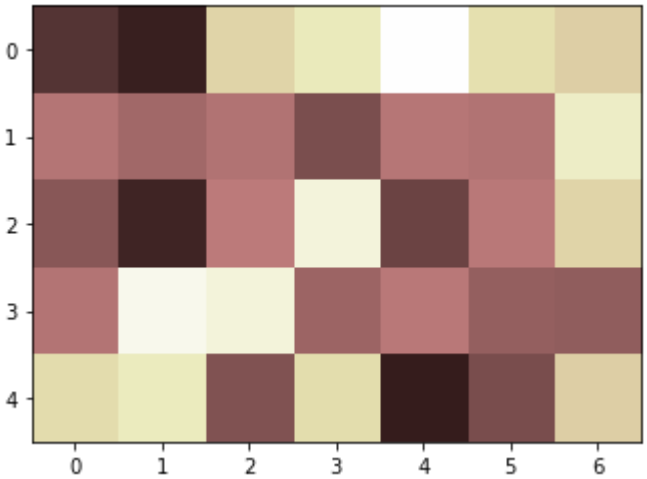
In [ ]:
```
import cv2 as cv
im = cv.imread(r'G:\Sem4\Image Processing\Ex1\gal_gaussian.png')

blur = cv.GaussianBlur(im,(5,5),0)

cv.namedWindow('Image', cv.WINDOW_AUTOSIZE)
cv.imshow('Image',im)
```

```
cv.waitKey(0)
cv.imshow('Image',blur)
cv.waitKey(0)
cv.destroyAllWindows()
```

In [ ]:
```
import numpy as np
import cv2 as cv
import matplotlib.pyplot as plt
im = np.zeros((40,60),dtype=np.uint8) #Important - data type of img is uint8

im [0:21,30:61] = 125

fig, ax = plt.subplots()

ax.imshow(im, cmap='gray', vmin=0 , vmax=255 )
plt.show()
```



In [ ]:
```
im2 = np.random.randint(255, size = (5,7),dtype=np.uint8)
fig, ax = plt.subplots()
im [21:40,0:31] = 190

ax.imshow(im2, cmap='pink', vmin=0 , vmax=255 )
plt.show()
```



In [ ]:
```
import cv2 as cv
import matplotlib.pyplot as plt
im = cv.imread(r'G:\Sem4\Image Processing\Ex1\tom_dark.jpg')
```

```
fig, ax = plt.subplots()
ax.imshow(im)
plt.show()
```

In [ ]:

```
#using gain and bias parameters
alpha = 1.5 # Contrast control (1.0-3.0)
beta = 50 # Brightness control (0-100)

adjusted = cv.convertScaleAbs(im, alpha=alpha, beta=beta)

fig, ax = plt.subplots()
ax.imshow(adjusted)
plt.show()
```