```
#Question 1
1. a = [10,12,19,17,-13,18,27,30,-12,-27]
Convert the above list into a NumPy array and filter out the numbers with
absolute
value(modulus value) less than 20
```

In [1]:
```
a = [10,12,19,17,-13,18,27,30,-12,-27]
```

In [2]:
```
import numpy as np
x=np.abs(np.array(a))
x= x[(x>20)]
x
```

Out[2]:
```
array([27, 30, 27])
```

```
#Question 2

2. Create a NumPy array with the dimensions 10,2,5 using the arrange function
```

In [4]:
```
a= np.arange(10)

a
```

Out[4]:
```
array([0, 1, 2, 3, 4, 5, 6, 7, 8, 9])
```

In [5]:
```
b = np.arange(2)

b
```

Out[5]:
```
array([0, 1])
```

In [6]:
```
c = np.arange(5)

c
```

Out[6]:
```
array([0, 1, 2, 3, 4])
```

```
#Question 3
3. Write a NumPy program to create a vector with values from 0 to 20 and change
the sign of
the numbers in the range from 9 to 15
```

In [11]:
```
a = np.arange(21)
a
```

Out[11]:
```
array([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13, 14, 15, 16,
       17, 18, 19, 20])
```

In [12]:
```
b = np.where((a>=9)&(a<=15), -a,a)
b
```

Out[12]:
```
array([  0,   1,   2,   3,   4,   5,   6,   7,   8,  -9, -10, -11, -12,
       -13, -14, -15,  16,  17,  18,  19,  20])
```

```
#Question 4
4. Write a NumPy program to create a 3x4 matrix filled with values from 10 to 21
```

In [13]:
```
a= np.arange(10,22).reshape((3,4))
a
```

Out[13]:
```
array([[10, 11, 12, 13],
       [14, 15, 16, 17],
       [18, 19, 20, 21]])
```

```
#Question 5
5. Write a NumPy program to create a 5x5 zero matrix with elements on the main
diagonal
equal to 1, 2, 3, 4(Hint: Google how to change individual values in np array)
```

In [15]:
```
a= np.zeros((5,5))
a
```

Out[15]:
```
array([[0., 0., 0., 0., 0.],
       [0., 0., 0., 0., 0.],
       [0., 0., 0., 0., 0.],
       [0., 0., 0., 0., 0.],
       [0., 0., 0., 0., 0.]])
```

In [16]:
```
b =np.diag([0, 1, 2, 3, 4])
b
```

Out[16]:
```
array([[0, 0, 0, 0, 0],
       [0, 1, 0, 0, 0],
       [0, 0, 2, 0, 0],
       [0, 0, 0, 3, 0],
       [0, 0, 0, 0, 4]])
```

```
#Question 6
6. Write a NumPy program to multiply two given arrays of the same size element-
by-element
```

In [17]:
```
a=np.arange(1,10).reshape((3,3))
print(a)
b=np.arange(11,20).reshape((3,3))
print(b)
print(np.multiply(a, b))
```

```
[[1 2 3]
 [4 5 6]
 [7 8 9]]
[[11 12 13]
 [14 15 16]
 [17 18 19]]
[[ 11  24  39]
 [ 56  75  96]
 [119 144 171]]
```

```
#Question 7
7. Write a NumPy program to create an array of equal shapes and data types of a
given array
```

In [29]:
```
x=np.arange(1,17).reshape((4,4))
print(x)
y=np.ones_like(x)
print(y)
```

```
[[ 1  2  3  4]
 [ 5  6  7  8]
 [ 9 10 11 12]
 [13 14 15 16]]
[[1 1 1 1]
 [1 1 1 1]
 [1 1 1 1]
 [1 1 1 1]]
```

In [ ]:
```
```