In [6]:
```
#sorting arrays in numpy
import numpy as np
a=np.array([1,9,2,7,3,6,4])
print(a)
#basic sort function
np.sort(a)#without modifying input array
a.sort()
print("Sorted array",a)
```

```
[1 9 2 7 3 6 4]
Sorted array [1 2 3 4 6 7 9]
```

In [10]:
```
a=np.array([1,9,2,7,3,6,4])
print(a)
#argsort will return original indices of elements in sorted array
index_list=a.argsort()
print("Original indices of elements in sorted array:")
print(index_list)
#by fancy indexing with argsort we get sorted array
print("Sorted array=")
print(a[index_list])
```

```
[1 9 2 7 3 6 4]
Original indices of elements in sorted array:
[0 2 4 6 5 3 1]
Sorted array=
[1 2 3 4 6 7 9]
```

In [19]:
```
#sorting along rows or columns
a=np.array([9,1,2,7,6,3,4,8]).reshape((4,2))
print("Original array=")
print(a)
row_sorted=np.sort(a,axis=1)#elements in each row is sorted
column_sorted=np.sort(a,axis=0)#elements in each column is sorted
print("Sorting along rows=")
print(row_sorted)
print("Sorting along column=")
print(column_sorted)
```

```
Original array=
[[9 1]
 [2 7]
 [6 3]
 [4 8]]
Sorting along rows=
[[1 9]
 [2 7]
 [3 6]
 [4 8]]
Sorting along column=
[[2 1]
 [4 3]
 [6 7]
 [9 8]]
```

In [22]:
```
#partial sorting
#partition takes a value k and prints minimum k value in arbitary order and then rest of array in arbitary order
a=np.array([1,9,3,7,4,0,5,8])
print("a=")
print(a)
partial_sorted=np.partition(a,3)#first 3 minimum elements in arbitary order then next three elements in arbitary order
print("Partially sorted array=")
print(partial_sorted)
```

```
a=
[1 9 3 7 4 0 5 8]
Partially sorted array=
[1 0 3 4 5 7 9 8]
```

In [30]:
```
#partial sorting along rows and columns
a=np.random.randint(0,10,(4,5))
print("a=")
print(a)
partial_sorted_row=np.partition(a,3,axis=1)#partial sorting of minimum 3 elements along row
partial_sorted_column=np.partition(a,2,axis=0)#partial sorting of minimum 3 elements along column
print("Partial sorted array along row=")
print(partial_sorted_row)
print("Partial sorted array along column=")
print(partial_sorted_column)
```

```
a=
[[7 8 4 0 8]
 [5 7 8 5 6]
 [3 9 2 9 7]
 [0 3 0 6 7]]
Partial sorted array along row=
[[0 4 7 8 8]
 [5 5 6 7 8]
 [2 3 7 9 9]
 [0 0 3 6 7]]
Partial sorted array along column=
[[0 3 0 0 6]
 [3 7 2 5 7]
 [5 8 4 6 7]
 [7 9 8 9 8]]
```