Syntax: module.array(datatype,valuelist)

Method - 1

In [1]:
```
1 import array
2 a=array.array('i',[10,20,30]) # a - array name, array - Module, .array -class
3 print(a)
```

```
array('i', [10, 20, 30])
```

In [2]:
```
1 import array as arr
2 a=arr.array('i',[10,20,30])
3 print(a)
```

```
array('i', [10, 20, 30])
```

Method - 2

from array import*

In [3]:
```
1 from array import*
2 a = array('i',[10,20,30])
3 print(a)
```

```
array('i', [10, 20, 30])
```

Error

In [4]:
```
1 import array as arr
2 a=arr.array('i',[1,2,'bala']) #array consists two different datatypes i.e., integer
3 print(a)
```

```
---------------------------------------------------------------------------
TypeError                                 Traceback (most recent call last)
Cell In[4], line 2
      1 import array as arr
----> 2 a=arr.array('i',[1,2,'bala']) #array consists two different datatypes i.e., int
eger and string
      3 print(a)

TypeError: 'str' object cannot be interpreted as an integer
```

datatypes in arrays

In [5]:
```
1 import array as arr
2 a=arr.array('b',[123,127,-128]) #signed char, Value range: -128 to +127
3 print(a)
```

```
array('b', [123, 127, -128])
```

In [6]:
```
import array as arr
a=arr.array('B',[123,255,38,57]) #Unsigned char, Value range: 0 to 255
print(a)
```

```
array('B', [123, 255, 38, 57])
```

In [7]:
```
import array as arr
a=arr.array('h',[-32768,32759,32767]) #Signed short, Value range: -32,768 to 32,767
print(a)
```

```
array('h', [-32768, 32759, 32767])
```

In [8]:
```
import array as arr
a=arr.array('H',[65,349,65535]) #Unsigned short, Value range: 0 to 65,535
print(a)
```

```
array('H', [65, 349, 65535])
```

In [9]:
```
import array as arr
a=arr.array('i',[-1267,245,2147483647]) #Signed int, Value range: -2,147,483,648 to
print(a)
```

```
array('i', [-1267, 245, 2147483647])
```

In [10]:
```
import array as arr
a=arr.array('I',[1267,245,4294967295]) #Unsigned int, Value range: 0 to 4,294,967,29
print(a)
```

```
array('I', [1267, 245, 4294967295])
```

In [11]:
```
import array as arr
a=arr.array('l',[1267,245,2147483647]) #Signed long, Value range: -2,147,483,648 to
print(a)
```

```
array('l', [1267, 245, 2147483647])
```

In [12]:
```
import array as arr
a=arr.array('L',[1267,245,4294967295]) #Unsigned long, Value range: 0 to 4,294,967,2
print(a)
```

```
array('L', [1267, 245, 4294967295])
```

In [13]:
```
import array as arr
a=arr.array('q',[1267,245,9223372036854775807]) #Signed long long

print(a)               #Value range: -9,223,372,036,854,775,808 to 9,223,372,036,854
```

```
array('q', [1267, 245, 9223372036854775807])
```

In [14]:
```
import array as arr
a=arr.array('Q',[1267,245,18446744073709551615]) #Unsigned long long

print(a)   #Value range: 0 to 18,446,744,073,709,551,615
```

```
array('Q', [1267, 245, 18446744073709551615])
```

In [15]:
```
import array as arr
a=arr.array('f',[12.6745,245.4897,38972.5436]) #float,  Value range: 3.4E +/- 38
print(a)
```

```
array('f', [12.674500465393066, 245.4897003173828, 38972.54296875])
```

In [16]:
```
import array as arr
a=arr.array('d',[12.6745,245.4897,38972.5436]) #double,  Value range: 1.7E +/- 308
print(a)
```

```
array('d', [12.6745, 245.4897, 38972.5436])
```

In [17]:
```
import array as arr
a=arr.array('u',['a','{','}','b']) #Unicode character,  Value range: 0 to 0x10FFFF
print(a)
```

```
array('u', 'a{}b')
```

Array Processing Functions

1. Accessing Array Element

In [18]:
```
import array as arr
a=arr.array('i',[1,2,3]) #signed char, Value range: -128 to +127
print('The array is : ',a)
print(a[0])
print(a[1])
```

```
The array is :  array('i', [1, 2, 3])
1
2
```

2. Slicing of array

In [19]:
```
import array as arr
a=arr.array('i',[10,20,30,40,50,60])
print('The array is : ',a) #prints complete array elements
print('The array is : ',a[:]) #prints array elements from 0 index to last index posi
print('The array is : ',a[0:]) #prints array elements from 0 index to last index pos
print('The array is : ',a[:len(a)])#prints array elements from 0 index to length of
print('The array is : ',a[0::2]) #prints array elements from 0 index to last with st
print('The array is : ',a[2:-1]) #prints array elements from +2 index to -1 index po
print('The array is : ',a[::-1]) #prints the array elements in reverse.
```

```
The array is :  array('i', [10, 20, 30, 40, 50, 60])
The array is :  array('i', [10, 20, 30, 40, 50, 60])
The array is :  array('i', [10, 20, 30, 40, 50, 60])
The array is :  array('i', [10, 20, 30, 40, 50, 60])
The array is :  array('i', [10, 30, 50])
The array is :  array('i', [30, 40, 50])
The array is :  array('i', [60, 50, 40, 30, 20, 10])
```

3. Modifying an element in array

In [20]:
```
import array as arr
a=arr.array('i',[10,20,30,40,50,60,70])
print('The array is : ',a)
a[0]=100
print('The array is : ',a)
a[1:3] =arr.array('i',[200,300])
print('The array is : ',a)
```

```
The array is :  array('i', [10, 20, 30, 40, 50, 60, 70])
The array is :  array('i', [100, 20, 30, 40, 50, 60, 70])
The array is :  array('i', [100, 200, 300, 40, 50, 60, 70])
```

4. a.insert (i,x) - Inserting an element at the specified position

In [21]:
```
import array as arr
a=arr.array('i',[10,20,30])
print('The array is : ',a)
a.insert(3,40)
a.insert(4,50)
print('The array is : ',a)
```

```
The array is :  array('i', [10, 20, 30])
The array is :  array('i', [10, 20, 30, 40, 50])
```

In [22]:
```
from math import*
a=array('i',[10,20,30])
print('The array is : ',a)
a.insert(3,40)
a.insert(4,50)
print('The array is : ',a)
```

```
The array is :  array('i', [10, 20, 30])
The array is :  array('i', [10, 20, 30, 40, 50])
```

5. a.append() - appends an element to array

In [23]:
```
import array as arr
a=arr.array('i',[10,20,30])
print('The array is : ',a)
a.append(50)
a.append(40)
print('The array is : ',a)
```

```
The array is :  array('i', [10, 20, 30])
The array is :  array('i', [10, 20, 30, 50, 40])
```

6.extend - appends iterable to the array

In [24]:
```
import array as arr
a=arr.array('i',[10,20,30])
print('The array is : ',a)
a.extend([40,50,60])
print('The array is : ',a)
```

```
The array is :  array('i', [10, 20, 30])
The array is :  array('i', [10, 20, 30, 40, 50, 60])
```

7.Concatenate two arrays

In [25]:
```
import array as arr
a=arr.array('i',[10,20,30])
b=arr.array('i',[40,50,60])
c=a+b
print('The array a is : ',a)
print('The array b is : ',b)
print('The array b is : ',c)
```

```
The array a is :  array('i', [10, 20, 30])
The array b is :  array('i', [40, 50, 60])
The array b is :  array('i', [10, 20, 30, 40, 50, 60])
```

8. a.remove() - Removing a specific element in array

In [26]:
```
1 import array as arr
2 a=arr.array('i',[10,20,30])
3 print('The array is : ',a)
4 a.remove(20)
5 print('The array is : ',a)
```

```
The array is :  array('i', [10, 20, 30])
The array is :  array('i', [10, 30])
```

9. a.pop() - removes last element from an array

In [27]:
```
1 import array as arr
2 a=arr.array('i',[10,20,30,40,50,60])
3 print('The array is : ',a)
4 a.pop() #removes the last element in the array
5 print('The array is : ',a)
6 a.pop(2) #removes the element at the specified position
7 print('The array is : ',a)
```

```
The array is :  array('i', [10, 20, 30, 40, 50, 60])
The array is :  array('i', [10, 20, 30, 40, 50])
The array is :  array('i', [10, 20, 40, 50])
```

10. del a[ ] - Deleting an element from array / deletes complete array

In [28]:
```
1 import array as arr
2 a=arr.array('i',[10,20,30,40,50])
3 print('The array is : ',a)
4 del a[1]
5 print('The array is : ',a)
6 del a[:] #deletes elements of entire array
7 print('The array is : ',a)
```

```
The array is :  array('i', [10, 20, 30, 40, 50])
The array is :  array('i', [10, 30, 40, 50])
The array is :  array('i')
```

11. a.index() - Position of the element

In [29]:
```
1 import array as arr
2 a=arr.array('i',[10,30,40,50,20])
3 print('The array is : ',a)
4 print(a.index(20)) #returns the position of the element in the array for the first o
```

```
The array is :  array('i', [10, 30, 40, 50, 20])
4
```

12 a.count() - counts the element occured no.of times in the array

In [30]:
```
import array as arr
a=arr.array('i',[10,30,40,50,20,20])
print('The array is : ',a)
print(a.count(20)) #counts the element occured no.of times in the array
```

```
The array is :  array('i', [10, 30, 40, 50, 20, 20])
2
```

13. a.reverse() - reverse the elements of an array

In [31]:
```
import array as arr
a=arr.array('i',[10,20,30,40,50,60])
a.reverse()
print('The array is : ',a)
```

```
The array is :  array('i', [60, 50, 40, 30, 20, 10])
```

14. a.fromlist(listname) - appends a list to the array

In [32]:
```
l1 = [100,200,300] #list
import array as arr
a=arr.array('i',[10,30,40,50,20,20])
print('The array is : ',a)
a.fromlist(l1) #appends a list to the present array.
print('The array is : ',a)
```

```
The array is :  array('i', [10, 30, 40, 50, 20, 20])
The array is :  array('i', [10, 30, 40, 50, 20, 20, 100, 200, 300])
```

15. a.tolist() - converts an array into list

In [33]:
```
import array as arr
a=arr.array('i',[10,20,30,40,50,60])
print('The array is : ',a)
a.pop() #removes the last element in the array
print('The array is : ',a)
b = a.tolist() #removes the element at the specified position
print('The list is : ',b)
```

```
The array is :  array('i', [10, 20, 30, 40, 50, 60])
The array is :  array('i', [10, 20, 30, 40, 50])
The list is :  [10, 20, 30, 40, 50]
```

16. a.fromunicode() - appends a string to the array

In [34]:
```
s = 'Bala' #list
import array as arr
a=arr.array('u',['M','R','U'])
print('The array is : ',a)
a.fromunicode(s) #appends a list to the present array.
print('The array is : ',a)
```

```
The array is :  array('u', 'MRU')
The array is :  array('u', 'MRUBala')
```

17. a.tounicode() - Converts an array into string.

In [35]:
```
from math import*
a=array('u',['M','R','U'])
print('The array is : ',a)
b=a.tounicode()
print('The string is : ',b)
```

```
The array is :  array('u', 'MRU')
The string is :  MRU
```

18. a.tobytes() - returns the binary representation of the given array.

In [36]:
```
from math import*
a=array('u',['M','R','U'])
print('The array is : ',a)
b=a.tobytes()
print('The string is : ',b)
```

```
The array is :  array('u', 'MRU')
The string is :  b'M\x00R\x00U\x00'
```

In [37]:
```
from math import*
a=array('i',[255,254,155])
print('The array is : ',a)
b=a.tobytes()
print('The string is : ',b)
```

```
The array is :  array('i', [255, 254, 155])
The string is :  b'\xff\x00\x00\x00\xfe\x00\x00\x00\x9b\x00\x00\x00'
```

19. a.byteswap() - swaps the byte ordering in memory, converting little endian to big endian (and vice versa)

In [38]:
```
from math import*
a=array('i',[10,20,30])
print('The array is : ',a)
a.tobytes()
print('The array is : ',a)
c=a.byteswap()
print('The string is : ',a)
d=a.byteswap()
print('The string is : ',a)
e=a.byteswap()
print('The string is : ',a)
```

```
The array is :  array('i', [10, 20, 30])
The array is :  array('i', [10, 20, 30])
The string is :  array('i', [167772160, 335544320, 503316480])
The string is :  array('i', [10, 20, 30])
The string is :  array('i', [167772160, 335544320, 503316480])
```

a.fromfile() - Will discuss at the time of 5th unit

a.tofile() - Will discuss at the time of 5th unit

Converting an iterable to array

In [39]:
```
1 import array as arr
2 l1 = [10,20,30]
3 a=arr.array('i',l1)
4 print(a)
```

```
array('i', [10, 20, 30])
```

In [40]:
```
1 from array import*
2 l1 = [10,20,30]
3 a=array('i',l1)
4 print(a)
```

```
array('i', [10, 20, 30])
```