In [1]:
```
import array
b=array.array('i',[1,2,3,4,5])
print(b)
```

```
array('i', [1, 2, 3, 4, 5])
```

In [2]:
```
import array as arr
c=arr.array('i',[1,2,3,4,5])
print(c)
```

```
array('i', [1, 2, 3, 4, 5])
```

In [3]:
```
from array import *
d=array('i',[1,2,3,4,5])
print(d)
```

```
array('i', [1, 2, 3, 4, 5])
```

In [4]:
```
#3.Using numpy module
import numpy
a=numpy.array([1,2,3,4,5])
print(a)
```

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

In [5]:
```
import numpy as np
a=np.array([1,2,3,4,5])
print(a)
```

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

In [7]:
```
from numpy import *
a=array([1,2,3,4,5])
print(a)
```

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

In [8]:
```
# To display an array in three different ways
# creating array and displaying in three different ways
a=[1,2,3,4,5]
#method-1
print(a)
```

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

In [10]:
```
#Method-2
for i in a:
    print(i,end=" ")
```

```
1 2 3 4 5
```

In [11]:
```
#method-3
print()
for i in range(len(a)):
    print(a[i],end=" ")
```

```

1 2 3 4 5
```

In [12]:
```
# creating arrays by using functions from numpy
from numpy import *
a=linspace(0,10,5)

#in python the numpy.linspace() function generates an array of evenly spaced nc
print(a)

b=logspace(0,10,5)
#in python the numpy.linspace() function generates an array of evenly spaced nc
print(b)

c=arange(1,10,2)
#same as range function
print(c)

d=zeros(10,int)
print(d)
d=zeros(10,float)
print(d)
d=ones(10,int)
print(d)
d=ones(10,float)
print(d)
```

```
[ 0.   2.5  5.   7.5 10. ]
[1.00000000e+00 3.16227766e+02 1.00000000e+05 3.16227766e+07
 1.00000000e+10]
[1 3 5 7 9]
[0 0 0 0 0 0 0 0 0 0]
[0. 0. 0. 0. 0. 0. 0. 0. 0. 0.]
[1 1 1 1 1 1 1 1 1 1]
[1. 1. 1. 1. 1. 1. 1. 1. 1. 1.]
```

In [16]:
```
from numpy import*
d=zeros(10,float)
print(d)
```

```
[0. 0. 0. 0. 0. 0. 0. 0. 0. 0.]
```

In [19]:
```
#Read an array interactively using array module
from array import *
a=array('i',[])
n=int(input("How many elements: "))
for i in range(n):
    x=int(input("enter element :"))
    a.append(x)
print(a)
```

```
How many elements: 6
enter element :1
enter element :2
enter element :4
enter element :6
enter element :7
enter element :8
array('i', [1, 2, 4, 6, 7, 8])
```

Read an array interactively using numpy module

from numpy import * n=int(input("How many elements: ")) a=zeros(n,'i') for i in range(n): x=int(input("enter element :")) a[i]=x print(a)

In [21]:
```
# Read an array interactively using numpy module
from numpy import *
n=int(input("How many elements: "))
a=zeros(n,'i')
for i in range(n):
    x=int(input("enter element :"))
    a[i]=x
print(a)
```

```
How many elements: 6
enter element :1
enter element :2
enter element :3
enter element :4
enter element :5
enter element :6
[1 2 3 4 5 6]
```

In [24]:
```
# to add two matrices
from numpy import *

# Define the size of the matrices
rows = int(input("Enter the number of rows: "))
cols = int(input("Enter the number of columns: "))

# Initialize the matrices as two-dimensional arrays

mat1 = zeros((rows, cols))
mat2 = zeros((rows, cols))
c=zeros((rows,cols))
# Read the elements from keyboard input for the first matrix
print("Enter the elements for the first matrix:")
for i in range(rows):
    for j in range(cols):
        val = int(input("Enter the element for matrix1: "))
        mat1[i][j] = val

# Read the elements from keyboard input for the second matrix

print("Enter the elements for the second matrix:")

for i in range(rows):
    for j in range(cols):
        val = int(input("Enter the element for matrix2 : "))
        mat2[i][j] = val

# Add the matrices

#res = mat1 + mat2

for i in range(rows):
    for j in range(cols):
        c[i][j]=mat1[i][j]+mat2[i][j]

# Print the result matrix print("The sum of the matrices is:")

for i in range(rows):
    for j in range(cols):
        print(c[i][j],end=" ")
print()
```

```
Enter the number of rows: 2
Enter the number of columns: 2
Enter the elements for the first matrix:
Enter the element for matrix1: 1
Enter the element for matrix1: 1
Enter the element for matrix1: 1
Enter the element for matrix1: 1
Enter the elements for the second matrix:
Enter the element for matrix2 : 2
Enter the element for matrix2 : 2
Enter the element for matrix2 : 2
Enter the element for matrix2 : 2
3.0 3.0 3.0 3.0
```

In [6]:

```
# To multiply two matrices
import numpy as np
# Define the size of the matrices
rows1 = int(input("Enter the number of rows for the first matrix: "))
cols1 = int(input("Enter the number of columns for the first matrix: "))
rows2 = int(input("Enter the number of rows for the second matrix: "))
cols2 = int(input("Enter the number of columns for the second matrix: "))

# Check if the matrices can be multiplied
if cols1 != rows2:
    print("Error: the matrices cannot be multiplied.")
else:
# Initialize the matrices as two-dimensional arrays
    mat1 = np.zeros((rows1, cols1))
    mat2 = np.zeros((rows2, cols2))
    c=np.zeros((rows1,cols2))
# Read the elements from keyboard input for the first matrix
print("Enter the elements for the first matrix:")
for i in range(rows1):
    for j in range(cols1):
        val = int(input("Enter the element for mat1: "))
        mat1[i][j] = val
# Read the elements from keyboard input for the second matrix
print("Enter the elements for the second matrix:")
for i in range(rows2):
    for j in range(cols2):
        val = int(input("Enter the element for mat2: "))
        mat2[i][j] = val
# Multiply the matrices
#res = np.dot(mat1, mat2)
for i in range(rows1):
    for j in range(cols2):
        c[i][j]=0
        for k in range(cols1):
            c[i][j]=c[i][j]+mat1[i][k]*mat2[k][j]
# Print the result matrix
    print("The product of the matrices is:")
for i in range(rows1):
     for j in range(cols2):
            print(c[i][j],end=" ")
print()
```

```
Enter the number of rows for the first matrix: 2
Enter the number of columns for the first matrix: 2
Enter the number of rows for the second matrix: 2
Enter the number of columns for the second matrix: 2
Enter the elements for the first matrix:
Enter the element for mat1: 1
Enter the element for mat1: 1
Enter the element for mat1: 1
Enter the element for mat1: 1
Enter the elements for the second matrix:
Enter the element for mat2: 2
Enter the element for mat2: 2
Enter the element for mat2: 2
Enter the element for mat2: 2
The product of the matrices is:
The product of the matrices is:
4.0 4.0 4.0 4.0
```

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In [9]:

```python
# Transpose of a matrix
from numpy import *
# Define the size of the matrices
rows = int(input("Enter the number of rows: "))
cols = int(input("Enter the number of columns: "))
# Initialize the matrices as two-dimensional arrays
mat1 = zeros((rows, cols))
mat2 = zeros((cols, rows))
# Read the elements from keyboard input for the first matrix
print("Enter the elements for the first matrix:")
for i in range(rows):
    for j in range(cols):
        val = int(input(f"Enter the element for row {i+1}, column {j+1}: "))
        mat1[i][j] = val
# Transpose the matrices
for i in range(rows):
    for j in range(cols):
        mat2[j][i] =mat1[i][j]
# Print the result matrix
print("The transpose of the matrices is:")
for i in range(cols):
    for j in range(rows):
        print(mat2[i][j],end=" ")
print()
```

```
Enter the number of rows: 2
Enter the number of columns: 2
Enter the elements for the first matrix:
Enter the element for row 1, column 1: 1
Enter the element for row 1, column 2: 2
Enter the element for row 2, column 1: 1
Enter the element for row 2, column 2: 2
The transpose of the matrices is:
1.0 1.0 2.0 2.0
```

In [ ]: