

**Name: Jhanvi Rajpara**

**Roll no:IT23B42**

**Numpy Library**

```
import numpy as np
print("Hello World")
[1,2,3,4]
#Array
a=np.array([1,2,3,4])
print(a)
print("array a:",a)
print(f"array:{a}")
print("array a:{}".format(a))

print(f"ndin:{a.ndim}") #return the array of Din type
print(f"size:{a.size}") #return the array of Size type
print(f"shape:{a.dtype}")#return the array of Shape type
print(f"itemsiz:{a.itemsize}")#return the array of itemsize type
b=np.array([[1,2,3],[5,6,7]])
print(b)
#Array Addition
b=np.array([4,5,6,7])
c=np.add(a,b)
print(c)
#Array Subtraction
b=np.array([[4,5,6,7],[4,5,6,7]])
d=np.subtract(a,b)
print(d)
b=np.array([[1,2,3,4],[5,6,7,8]])
d=np.multiply(a,b)
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print(d)

#Array Modulo
b=np.array([[1,2,3,4],[5,6,7,8]])
d=np.mod(a,b)
print(d)

#Array Power
b=np.array([[1,2,3,4],[5,6,7,8]])
d=np.power(a,b)
print(d)

#Array Absolute
b=np.array([[1,2,3,4],[4,5,6,7]])
d=np.abs(a,b)
print(d)

#Remainder
b=np.array([[1,2,3,4],[5,6,7,8]])
d=np.remainder(a,b)
print(d)

s=np.array(["jhanvi","vruti","vidhi","jeel"])
print(s)
print(f"size:{a.size}")
print(f"shape:{a.shape}")
print(f"dtype:{a.dtype}")
print(f"itemsize:{a.itemsize}")

#Zero
z=np.zeros((2,3))
print(z)

#ones
one=np.ones((3,4))
print(one)

#Empty
empty=np.empty((2,2))
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print(empty)

#Arrange
ar=np.arange(1,5,0.5)
print(ar)

#linspace
l=np.linspace(1,5,8)
print(l)


#Random
r=np.random.random((2,3))
print(r)

#Sliced_array
a=np.array([[1,2,3],[4,5,6]])
print(a)
sliced_arr=a[:2,:2]
print("sliced_arr:",sliced_arr)

#Indexed
indexed_arr=a[[1,0],[1,0]]
print(indexed_arr)

#Sum
print(a.sum())

#Squareroot
a1=np.array([25,45,56,81])
print(np.sqrt(a1))

b=a+5
print(b)

# Dot
m1=np.array([[1,2,3],[4,5,6],[7,8,9]])
m2=np.array([[4,5,6],[4,7,9],[6,7,8]])

m3=np.dot(m1,m2)
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print(m3)

#Boolean

bool=np.array([[True,True],[True,False]])

print(np.all(bool))

print(np.all(bool,axis=0))

bool=np.array([[True,True,False],[False,True,False]])

print("any() with axis none",np.all(bool))

print("any() with axis none",np.all(bool,axis=0))

print("any() with axis none",np.all(bool,axis=1))

a1=np.arange(0,9,3)

print(a1)

#Reshape

a1=np.arange(8)

print(a1)

re=a1.reshape(2,4)

print(re)

#Vertical Stack

v=np.vstack((m1,m2,m3))

print(v)

#horizontal Stack

h=np.hstack((m1,m2,m3))

print(h)

#Horizontal Split

hsplit=np.hsplit(h,3)

print(hsplit)

#Vertical Split

vsplit=np.vsplit(v,3)

print(vsplit)

arr=np.array([23,45,56,81])

print("sqrt:",np.sqrt(arr))#Squareroot

print("Exp:",np.exp(arr))#exponteial
```

```
print("sin:",np.sin(arr))#sin
print("cos:",np.cos(arr))#cos
print("Log:",np.log(arr))#Log
print("Sum:",np.sum(arr))#Sum
print("Std:",np.std(arr))#Standard deviation
print("random: {}".format(np.random.random(20)));#random
print("rand: {}".format(np.random.rand(3,4)));#Randint
print("randint: {}".format(np.random.randint(0,100,20)));
print("permutation: {}".format(np.random.permutation(np.arange(20))));#Permutation
```