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Lab: Ds LAB 3

Roll: 07

1 Write a program to find the factors of a given number (get input from user) using for loop.

```
x= int(input("Enter a number: "))
list=[]
for i in range(2,x):
if(x % i==0):
list.append(i)
if len(list)==0:
list.append(1);
print(list)
```

```
User@DESKTOP-FF8I8GD MINGW64 ~/Documents/ds lab/week3 exer (main)
$ python p1.py
Ennter a number: 12
[2, 3, 4, 6]
```

2. Find the sum of columns and rows using axis.

```
import numpy as np
arr=np.arange(15).reshape(3,5)
print(arr)
print("Row sum is:",arr.sum(axis=1))
print("Col sum is:",arr.sum(axis=0))
```

```
User@DESKTOP-FF8I8GD MINGW64 ~/Documents/ds lab/week3 exer (main)
$ python p2.py
[[ 0  1  2  3  4]
 [ 5  6  7  8  9]
 [10 11 12 13 14]]
Row sum is: [10 35 60]
Col sum is: [15 18 21 24 27]
```

3. Operations on Arrays (use numpy wherever required):
    a) Create array from list with type float
    b) Create array from tuple
    c) Creating a 3X4 array with all zeros
    d) Create a sequence of integers from 0 to 20 with steps of 5
    e) Reshape 3X4 array to 2X2X3 array
    f) Find maximum and minimum element of array, Row wise max and min, column wise maxand min and sum of elements. (Use functions max(), min(), sum())

```
import numpy as np
print(".....a.....")
A=np.array([2.3,5.65,10])

print("Floating NumPy Array 'A': ",A)

print(".....b .....")
my_tuple=([8,4,6],[1,2,3])
print("Tuple to array:")
print(np.array(my_tuple))

print(".....c .....")

mat=np.zeros((3,4))
print(mat)

print(".....d .....")

print("5 step interals from 0:20",np.arange(0,20,5))
print(".....e .....")

a=np.arange(12).reshape(3,4)
print("Before Reshape shape is",a.shape)
a=a.reshape(2,2,3)
```

```
print("Shape after reshape is",a.shape)
print()
print(".....f ......")
b=np.arange(12).reshape(3,4)
print("The Matrix is\n",b)

print("Max of each column:",b.max(axis=0))
print("Max of each row:",b.max(axis=1))
print("Min of Each Column is",b.min(axis=0))
print("Min of Each Column is",b.min(axis=1))
print("Sum of each colun is",a.sum(axis=0))
print("Sum of each row is",a.sum(axis=1))
```

```
User@DESKTOP-FF8I8GD MINGW64 ~/Documents/ds lab/week3 exer (main)
$ python p2.py
.....a......
Floating NumPy Array 'A':  [ 2.3   5.65 10.  ]
.....b ......
Tuple to array:
[[8 4 6]
 [1 2 3]]
.....c ......
[[0. 0. 0. 0.]
 [0. 0. 0. 0.]
 [0. 0. 0. 0.]]
.....d ......
5 step interals from 0:20 [ 0  5 10 15]
.....e ......
Before Reshape shape is (3, 4)
Shape after reshape is (2, 2, 3)

.....f ......
The Matrix is
 [[ 0  1  2  3]
 [ 4  5  6  7]
 [ 8  9 10 11]]
Max of each column: [ 8  9 10 11]
Max of each row: [ 3  7 11]
Min of Each Column is [0 1 2 3]
Min of Each Column is [0 4 8]
Sum of each colun is [[ 6  8 10]
 [12 14 16]]
Sum of each row is [[ 3  5  7]
 [15 17 19]]
```

4 .Write a program to transpose a given matrix

```
import numpy as np
a=np.arange(12).reshape(3,4)
```

```
print("Matrix is\n",a)
print("Transpose of a matrix is\n",a.T)
```

```
User@DESKTOP-FF8I8GD MINGW64 ~/Documents/ds lab/week3 exer (main)
$ python mat.py
Matrix is
 [[ 0  1  2  3]
 [ 4  5  6  7]
 [ 8  9 10 11]]
Transpose of a matrix is
 [[ 0  4  8]
 [ 1  5  9]
 [ 2  6 10]
 [ 3  7 11]]
```

5. Write a program to add two matrices.

```
import numpy as np
a=np.arange(12).reshape(3,4)
print("Matrix a is ")
print(a)
print("Matrix b is ")
b=np.ones((3, 4),dtype=int)
print(b)
print("Adding a and b")
print(a+b)
```

```
User@DESKTOP-FF8I8GD MINGW64 ~/Documents/ds lab/week3 exer (main)
$ python mat.py
Matrix a is
[[ 0  1  2  3]
 [ 4  5  6  7]
 [ 8  9 10 11]]
Matrix b is
[[1 1 1 1]
 [1 1 1 1]
 [1 1 1 1]]
Adding a and b
[[ 1  2  3  4]
 [ 5  6  7  8]
 [ 9 10 11 12]]
```

6. Write a program to find element wise product between two matrices.

```
import numpy as np
A=np.array([[1,2],[3,4]])
B=np.array([[2,0],[0,1]])
print("A:\n",A)
print("B:\n",B)
print("Element Wise Product:\n",A*B)
```