

Ayush Goyal 190905522
CSE D Roll 62

Distributed Systems Week 3: Lab 3: Python Basic Practice-III

Lab Exercise Programs for Week 3:

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

```
import numpy as np

x = int(input("Enter the number : "))
A = np.array([1])
for i in range(2, x+1):
    if x%i == 0:
        A = np.append(A, i)
print(A)
```

Output:

```
student@dslab-12:~/Desktop/DSLab/AyushGoyal190905522/Week_3$ python3 ques1.py
Enter the number : 15
[ 1  3  5 15]
student@dslab-12:~/Desktop/DSLab/AyushGoyal190905522/Week_3$
```

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

```
import numpy as np

A = np.array([[1, 2, 3], [4, 5, 6], [7, 8, 9]])
print(A)
rowSum = np.sum(A, axis = 1)
print('Row Sum is ', rowSum)
colSum = np.sum(A, axis = 0)
print('Column Sum is ', colSum)
```

Output:

```
student@dslab-12:~/Desktop/DSLab/AyushGoyal190905522/Week_3$ python3 ques2.py
[[1 2 3]
 [4 5 6]
 [7 8 9]]
Row Sum is  [ 6 15 24]
Column Sum is  [12 15 18]
student@dslab-12:~/Desktop/DSLab/AyushGoyal190905522/Week_3$
```

3. Operations on Arrays[use numpy wherever required]:

- Create array from list with type float
- 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 max and min element of array, row wise max and min, column wise max and min and sum of elements. (Use function max(), min(), sum()).

```
import numpy as np

x = [float(i) for i in input().split()]
A = np.array(x)
print(A)
t = tuple([float(i) for i in input().split()])
B = np.array(t)
print(B)
C = np.zeros((3, 4))
print(C)
D = np.reshape(C, (2, 2, 3))
print(D)
E = np.arange(0, 20, 5)
print(E)
F = np.array([[1, 2, 3], [4, 5, 6], [7, 8, 9]])
print(np.min(F, axis=1), np.min(F, 0), np.max(F, 1), np.max(F, 0), np.sum(F, 1), np.sum(F, 0))
```

Output:

```
student@dslab-12:~/Desktop/DSLAb/AyushGoyal190905522/Week_3$ python3 ques3.py
1 2 3 4 5 6
[1. 2. 3. 4. 5. 6.]
1 2 3 4 5
[1. 2. 3. 4. 5.]
[[0. 0. 0. 0.]
 [0. 0. 0. 0.]
 [0. 0. 0. 0.]]
[[[0. 0. 0.]
  [0. 0. 0.]]
 [0. 0. 0.]]

[[0. 0. 0.]
 [0. 0. 0.]]]
[ 0  5 10 15]
[1 4 7] [1 2 3] [3 6 9] [7 8 9] [ 6 15 24] [12 15 18]
student@dslab-12:~/Desktop/DSLAb/AyushGoyal190905522/Week_3$
```

4. Write a program to transpose a given matrix.

```
import numpy as np
F = np.array([[1, 2, 3], [4, 5, 6], [7, 8, 9]])
print(np.transpose(F))
```

Output:

```
student@dslab-12:~/Desktop/DSLAb/AyushGoyal190905522/Week_3$ python3 ques4.py
[[1 4 7]
 [2 5 8]
 [3 6 9]]
student@dslab-12:~/Desktop/DSLAb/AyushGoyal190905522/Week_3$
```

5. Write a program to add two matrices.

```
import numpy as np

F = np.array([[1, 2, 3], [4, 5, 6], [7, 8, 9]])
D = np.array([[1, 4, 7], [2, 5, 8], [3, 6, 9]])

print(F+D)
```

Output:

```
student@dslab-12:~/Desktop/DSLAb/AyushGoyal190905522/Week_3$ python3 ques5.py
[[ 2  6 10]
 [ 6 10 14]
 [10 14 18]]
student@dslab-12:~/Desktop/DSLAb/AyushGoyal190905522/Week_3$
```

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

```
import numpy as np

F = np.array([[1, 2, 3], [4, 5, 6], [7, 8, 9]])
D = np.array([[1, 4, 7], [2, 5, 8], [3, 6, 9]])

print(F*D)
```

Output:

```
student@dslab-12:~/Desktop/DSLAb/AyushGoyal190905522/Week_3$ python3 ques6.py
[[ 1  8 21]
 [ 8 25 48]
 [21 48 81]]
student@dslab-12:~/Desktop/DSLAb/AyushGoyal190905522/Week_3$
```

THE END