Lab 9

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CO1: To write, test, and debug simple Python programs

CO2: To implement Python programs with conditional, loops and functions

Task 1:- Creating Numpy Array

Python Code:

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

Output:

```
PS C:\Users\abc> & D:/python.exe "d:/Aryan/Semester - 3
[1 2 3 4 5]
```

Task 2:- Accesing The Elements Of Numpy Array

Python Code:

```
import numpy as np
a = np.array([[1,2,3,4,5],[6,1,2,3,4]])
print(a[1][0])
```

Output:

```
PS C:\Users\abc> & D:/python.exe "d:/Aryan/Semester - 3/
6
```

Task 3:- Checking The Types of Numpy Array

Python Code:

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

Output:

```
PS C:\Users\abc> & D:/python.exe "d:/Aryan/Semester - 3/Programming With
[1 2 3 4 5]
```

Task 4:- Creating Zero Matrix Using Numpy

Python Code:

```
import numpy as np
a = np.zeros((3,2))
print(a)
```

Output:

```
PS C:\Users\abc> & D:/python.exe "d:/Aryan/Semester - 3
[[0. 0.]
 [0. 0.]
 [0. 0.]]
```

Task 5:- Creating Matrix With all 1's Using Numpy

Python Code:

```
import numpy as np
a = np.ones((3,2))
print(a)
```

Output:

```
PS C:\Users\abc> & D:/python.exe "d:/
[[1. 1.]
 [1. 1.]
 [1. 1.]]
```

Task 6:- Initialize Numpy Array With Particular Value

Python Code:

```
import numpy as np
a = np.full((3,2),6)
print(a)
```

Output

```
PS C:\Users\abc> & D:/python.exe
[[6 6]
 [6 6]
 [6 6]]
```

Task 7:- Element By Element Multiplication of Numpy Array

Python Code:

```
import numpy as np
a = np.ones((3,2))
b = np.full((3,2),6)
c = a * b
print(c)
```

Output:

```
PS C:\Users\abc> & D:/python.exe
[[6. 6.]
 [6. 6.]
 [6. 6.]]
```

Task 9:- Implementing Arrange Function

Python Code:

```
import numpy as np
a = np.arange(10,20)
b = np.arange(0,101,5)
print(a)
print(b)
```

Output:

```
PS C:\Users\abc> & D:/python.exe "d:/Aryan/Semester - 3/Programming With Pyth
[10 11 12 13 14 15 16 17 18 19]
[  0   5  10  15  20  25  30  35  40  45  50  55  60  65  70  75  80  85
  90  95 100]
```

Task 10:- Generate Random Numbers in given range in Numpy Array

Python Code:

```
import numpy as np
a = np.random.randint(1,100,10)
print(a)
```

Output:

```
PS C:\Users\abc> & D:/python.exe "d:/Aryan/Semester - 3/Programming With Python/
[49 11 86 52 37 46 13 92 74 94]
PS C:\Users\abc>
```

Task 11:- Implementing Shape Function

Python Code:

```
import numpy as np
a = np.array([[1,2,3,4,5],[10,9,8,7,6]])
print(a)
print(a.shape)
a.shape = (5,2)
print(a)
```

Output:

```
PS C:\Users\abc> & D:/python.exe "d:/Aryan/Semester - 3/
[[ 1  2  3  4  5]
 [10  9  8  7  6]]
(2, 5)
[[ 1  2]
 [ 3  4]
 [ 5 10]
 [ 9  8]
 [ 7  6]]
```

Task 12:- Implementing Stack Functions

Python Code:

```
import numpy as np
a = np.array([[1,2,"B",4,5],[10,9,8,7,6]])
b = np.array([["A",9,8,7,6],[1,2,3,4,5]])
print(a)
print(b)
print(np.hstack((a,b)))
print(np.vstack((a,b)))
print(np.column_stack((a,b)))
```

Output:

```
PS C:\Users\abc> & D:/python.exe "d:/Aryan/Semester - 3/Programming With
[['1' '2' 'B' '4' '5']
 ['10' '9' '8' '7' '6']]
[['A' '9' '8' '7' '6']
 ['1' '2' '3' '4' '5']]
[['1' '2' 'B' '4' '5' 'A' '9' '8' '7' '6']
 ['10' '9' '8' '7' '6' '1' '2' '3' '4' '5']]
[['1' '2' 'B' '4' '5']
 ['10' '9' '8' '7' '6']
 ['A' '9' '8' '7' '6']
 ['1' '2' '3' '4' '5']]
[['1' '2' 'B' '4' '5' 'A' '9' '8' '7' '6']
 ['10' '9' '8' '7' '6' '1' '2' '3' '4' '5']]
```

Task 13:- Intersection And Union Of Numpy Array

Python Code:

```
import numpy as np
a = np.array([[1,2,3,4,5],[10,9,8,7,6]])
b = np.array([[10,9,8,66,6],[1,2,3,4,5]])
print(np.intersect1d(a,b))
print(np.setdiff1d(a,b))
print(np.setdiff1d(b,a))
```

Output:

```
PS C:\Users\abc> & D:/python.exe "d:/Aryan/Semester - 3/Programming
[ 1  2  3  4  5  6  8  9 10]
[7]
[66]
PS C:\Users\abc>
```

Task 14:- Arethematics Of Numpy Array

Python Code:

```
import numpy as np
a = np.array([[1,2,3,4,5],[10,9,8,7,6]])
b = np.array([[10,9,8,66,6],[1,2,3,4,5]])
print(a)
print(b)
print(a+b)
```

Output:

```
PS C:\Users\abc> & D:/python.exe "d:/Aryan/Semester - 3/Programming
[[ 1  2  3  4  5]
 [10  9  8  7  6]]
[[10  9  8 66  6]
 [ 1  2  3  4  5]]
[[11 11 11 70 11]
 [11 11 11 11 11]]
```

Task 15:- Adding Two Numpy Array

Python Code:

```
import numpy as np
a = np.array([10,20])
b = np.array([30,40])
print(np.sum([a,b]))
print(np.sum([a,b],axis=1))
print(np.sum([a,b],axis=0))
```

Output:

```
PS C:\Users\abc> & D:/python.exe "d:/Aryan/Semester - 3/Programming With
100
[30 70]
[40 60]
```

Post Lab

Task 1:- Write a python program to find longest string in the given list
l1 = ["ICT","Department","ICT Department"]

Python Code:

```
list1 = ["ICT","Department","ICT Deparment"]
max = len(list1[0])
for i in range(0,len(list1)) :
    if(len(list1[i]) > max) :
        max = i
print(f"The Longest Word In A List Is {list1[max]}")
```

Output:

```
PS C:\Users\abc> & D:/python.exe "d:/Aryan/Semester - 3/
The Longest Word In A List Is ICT Deparment
```

Task 2:- Write a python program to find the sum of unit digit in the number
Python Code:

```
l2 = [25,36]
sum = 0
for i in range(0,len(l2)) :
    sum = sum + (l2[i]%10)
print(f"The Sum Of All The Unit Digits Is {sum}")
```

Output:

```
PS C:\Users\abc> & D:/python.exe "d:/Aryan/Semester - 3/Programming With
The Sum Of All The Unit Digits Is 11
```

Task 3:- Write a Python function to find the maximum of three numbers.

Python Code:

```
max = 0
def max(a,b,c) :
    if(a>b) :
        if(a>c) :
            max = a
        else :
            max = c
    else :
        if(b>c) :
            max = b
        else :
            max = c
    return max
ans = max(345,567,434)
print(f"The Maximum Is {ans}")
```

Output:

```
PS C:\Users\abc> & D:/python.exe "d:/Aryan/Semester - 3/Programming With Python/
The Maximum Is 567
```

Task 4:- Write a Python function to sum all the numbers in a list.

Python Code:

```
def Sum(list1) :
    sum = 0
    for i in range(0,len(list1)) :
        sum = sum + list1[i]
    return sum
list2 = [12,23,34,45,56,67,78,89]
listsum = sum(list2)
print(f"The Sum Of All Element In {list2} Is {listsum}")
```

Output:

```
PS C:\Users\abc> & D:/python.exe "d:/Aryan/Semester - 3/Programming With Python/Lab
The Sum Of All Element In [12, 23, 34, 45, 56, 67, 78, 89] Is 404
```

Task 5:- Write a Python function to multiply all the numbers in a list.

Python Code:

```
def Mul(list1) :
    mul = 1
    for i in range(0,len(list1)) :
        mul = mul * list1[i]
    return mul
list3 = [98,87,76,65,54,43,32,21]
listmul = Mul(list3)
print(f"The Multiplication Of All Element In {list3} Is {listmul}")
```

Output:

```
PS C:\Users\abc> & D:/python.exe "d:/Aryan/Semester - 3/Programming With Python/Lab Manual/Lab- 9/
The Multiplication Of All Element In [98, 87, 76, 65, 54, 43, 32, 21] Is 65720939880960
```

Task 6:- Write a Python program to reverse a string.

Python Code:

```
string = input("Enter A String :- ")
print(string[::-1])
```

Output:

```
PS C:\Users\abc> & D:/python.exe "d:/Aryan/Semester - 3/Programming With Python/Lab
Enter A String :- Aryan123
321nayrA
```

Task 7:- Write a Python function to calculate the factorial of a number (a non-negative integer). The function accepts the number as an argument.

Python Code:

```
def fact(num) :
    ans = 1
    for i in range(1,num+1) :
        ans = ans * i
    return ans
num = int(input("Enter A Number :- "))
ans = fact(num)
if(num>=0) :
    print(f"The Factorial Of {num} Is {ans}")
else :
    print("Enter The Non-negative Integer")
```

Output:

```
PS C:\Users\abc> & D:/python.exe "d:/Aryan/Semester - 3/Programming With
Enter A Number :- 6
The Factorial Of 6 Is 720
```

Task 8:- Write a Python program to find missing numbers from a list.
Input: [1,2,5,10,11,14,17,20]
Output: [3,4,6,7,8,9,12,13,15,16,18,19]
Python Code:

```
list2 = [1,4,5,6,7,9,14,17,20]
listmis = []
for i in range(1,len(list2)) :
    for j in range(list2[i-1]+1,list2[i]) :
        listmis.append(j)
print(listmis)
```

Output:

```
PS C:\Users\abc> & D:/python.exe "d:/Aryan/Semester - 3/
[2, 3, 8, 10, 11, 12, 13, 15, 16, 18, 19]
```

Task 9:- Write a Python program to check a sequence of numbers is an arithmetic progression or not.
Input: [1,8,27,64] [1,3,7,2]
Output: True False
Python Code:

```
list1 = []
print("Enter 0 to Exit:- ")
print("Enter Arithmetic Progression :-")
while(True) :
    num = int(input())
    if(num == 0) :
        break
    list1.append(num)
def check(num,ref) :
    if(num == ref) :
        return True
    else :
        return False
power = math.log(list1[2],3)
anslist = []
for i in range(1,len(list1)) :
    anslist.append(check(math.log(list1[i],i+1),power))
j=0
for i in anslist :
    if(not i) :
        j+=1
        break
    else :
        continue
```

```
if(j == 0) :
   print("True")
else :
   print("False")
```

Output:

```
PS C:\Users\abc> & D:/python.exe "d:/Aryan/Semester - 3/Programmin
Enter 0 to Exit:-
Enter Arithmetic Progression :-
1
2
3
45
6
78
0
False
PS C:\Users\abc>
```

Task 10:- Write a python program to check whether the given numbers in list is palindrome or not. If palindrome then check number in list is prime or not.
Input: [121,132,454,111,147]

Python Code:

```
def isPalindrome(num) :
   s = str(num)
   for i in range(0,len(s)) :
      if(s[i] != s[len(s)-i-1]) :
         return False
      else :
         continue
   return True
def isprime(num) :
   prime = True
   for i in range(1,num) :
      if (num % i == 0) :
         prime = False
         break
   return(prime)
inlist = [121,132,454,111,147]
palindrome = []
prime = []
for i in inlist :
   palindrome.append(isPalindrome(i))
   if(isPalindrome(i)) :
      prime.append(isprime(i))
```

```
    else :
        prime.append(0)
print(palindrome)
print(prime)
```

Output:

```
PS C:\Users\abc> & D:/python.exe "d:/Aryan/Semester - 3/Programming With Pytho
[True, False, True, True, False]
[False, 0, False, False, 0]
```

Task 11:- Write a Python program to reverse of numbers from a list of integers, preserving order.
Input: [2334,4885,7776,8969]
Output: [4332,5884,6777,9698]

Python Code:

```
def revnum(list) :
    revnumlist = []
    for i in list :
        s = str(i)
        list = list[1:]
        rev = s[::-1]
        revnumlist.append(int(rev))
    return revnumlist
list = [2334,4885,7776,8969]
ans = revnum(list)
print(ans)
```

Output:

```
PS C:\Users\abc> & D:/python.exe "d:/Aryan/Semester - 3/Programming With
[4332, 5884, 6777, 9698]
```

Task 12:- Write a Python program to find the product of the units digits in the numbers of a given list. Input: [12, 23] Output: 6

Python Code:

```
def func(list) :
    ans = 1
    for i in list :
        ans = ans * i%10
    return ans
inputlist = [12,23]
ans = func(inputlist)
print(ans)
```

Output:

```
PS C:\Users\abc> & D:/python.exe "d:/Aryan/Semester - 3/Programming With Python/Lab Manual/Lab- 9/Post_Lab.py"
6
```

Task 13:- Write a Python program to remove duplicates from a list of integers, preserving order. Input: [1, 3, 4, 10, 4, 1, 43] Output: [1, 3, ,4, 10, 43]

Python Code:

```
inputlist = [1,3,4,10,4,1,43]
for i in range(0,len(inputlist)) :

for j in range(i + 1,len(inputlist)-1) :
        if(inputlist[i] == inputlist[j]) :
            del inputlist[j]
print(inputlist)
```

Output:

```
PS C:\Users\abc> & D:/python.exe "d:/Aryan/Semester - 3/Programming With Python/Lab Manual/Lab- 9/Post_Lab.py"
[1, 3, 4, 10, 43]
```

Task 14:- Write a Python program to find the sum of the even elements that are at odd indices in a given list. Input: [1,2,3,4,5,6,7] Output: 12

Python Code:

```
list2 = [1,2,3,4,5,6]
sum = 0
for i in range(0,len(list2)) :
    if(i%2 != 0 and list2[i]%2==0) :
        sum = sum + list2[i]
print(sum)
```

Output:

```
PS C:\Users\abc> & D:/python.exe "d:/Aryan/Semester - 3/Programming With Python/Lab
12
```