SIKSHA 'O' ANUSANDHAN
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Admission Batch: **Session:**

Laboratory Record

Programming in Python (CSE 3142)

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Minor Assignment -7

Mutable and Immutable objects

Q1) write a function that takes a list of values as input parameter and returns another list without any duplicates.

Program :-

```
def dupl (l1):
    l2 = []
    for m in l1:
        if m not in l2:
            l2.append (m)
    return l2
def main ():
    l1 = [7,6,5,8,7,8,9,6]
    print (dupl (l1))
if __name__ == '__main__':
    main()
```

Output :-

[7,6,5,8,9]

Q2) write a function that takes a list of numbers as input from the user and produces the corresponding cumulative list - where each element in the list at index i is the sum of elements at index j <= i.

Program :-

```
def rock (m1):
```

```
m2 = []
sum = 0
for i in m1:
    sum += i
    m2.append(sum)
return m2
```

Q3) Write a program that takes a sentence as input from the user and computes the frequency of each letter. Use a variable of dictionary type to maintain the count.

Program :-

```
def Inq(s):
    z = {}
    for m in sentence:
        if m in z:
            z[i] += 1
        else:
            z[i] = 1
    return z
def main():
    s = input("Enter the desired output sentence: ")
    print(z(s))
if __name__ == '__main__':
    main()
```

Q4) Identify the output produced when the following functions are invoked

1. def func():
    l1 = list()
    l2 = list()
    for i in range (0,5):
        l1.append(i)
        l2.append(i+3)
    print(l1)
    print(l2)

Output :-

[0, 1, 2, 3, 4]

[3, 4, 5, 6, 7]

2. def func():
    l1 = list()
    l2 = list()
    for i in range (0,5):
        l1.append(i)
        l2.append(i+3)
        l1, l2 = l2, l1
    print(l1)
    print(l2)

Output :- [3, 1, 5, 3, 7]

[0, 4, 2, 6, 4]

Q5) Determine the output of the following code snippets:

1.
```
c = [1,2,3,4,5,6,7,8,9,10]
result = 0
for i in range (0,10):
    if (c[i] % 2 == 0):
        result += c[i]
print (result)
```

Output :-

30

2.
```
c = [1,2,3,4,5,6,7,8,9,10]
result = 0
for i in range (0,10):
    if (c[i] % 2 != 0):
        result += c[i]
print (result)
```

output :-

25

3.
```
subject = 'computer'
subject = list (subject)
ch = subject [0]
for i in range (0, len (subject) - 1):
    subject [i] = subject [i+1]
subject [len (subject) - 1] = ch
print (' '. join (subject))
```

output :- omputerC

4. quantity = [15, 30, 12, 34, 56, 99]

```
total = 0
for i in range (0, len(quantity)):
    if (quantity[i] > 15):
        total += quantity[i]
print (total)
```

output :-

219

5. x = [1, 2, 4, 6, 9, 10, 14, 15, 17]

```
for i in range (0, len(x)):
    if (x[i] % 2 == 0):
        x[i] = 4 * i
    elif (x[i] % 3 == 0):
        x[i] = 9 * i
    else :
        x[i] *= 2
print(x)
```

output :-

[2, 4, 8, 12, 36, 20, 24, 63, 34]

Q6) write a function that takes n as an input and creates a list of n lists such that i^{th} list contains first five multiples of i.

```
def fun(n):
    return [[j * i for j in range(1,6)] for i in range(1, n+1)]
```

Q7) write a function that takes a number as an input parameter and returns the corresponding text in words. for example, an input 452, the function should return 'four five two'. Use a dictionary for mapping digits to their representation.

```
def fun(t):
    t = {0:'zero', 1:'one', 2:'Two', 3:'Three', 4:'four',
         5:'Five', 6:'six', 7:'seven', 8:'Eight', 9:'Nine'}
    l = [t[int(digit)] for digit in t]
    return ''.join(l)
```

Q8) Given the following inputs, indicate in each case (a) to (w), whether the statements will execute successfully. If, so, given what will be the output of execution? Also give the output of print statements (where applicable):

```
address = 'B-6, Lodhi road, Delhi'
list 1 = [1,2,3]
list 2 = ['a', 1, '=', 26, 'd', 4]
tuple 1 = ('a', 'e', 'i', 'o', 'u')
tuple 2 = ([2,4,6,8], [3,6,9], [4,8], 5)
dict 1 = {'apple':'red', 'mango':'yellow', 'orange':'orange'}
dict 2 = {'X':['eng','hindi','maths','science'], 'XII':['eng-
    -lish','physics','chemistry','maths']}
```

a. list1 [3] = 4

output :-

IndexError : list assignment index out of range.

b. print (list1 * 2)

output :-

[1, 2, 3, 1, 2, 3]

c. print (min (list2))

output :-

TypeError : '<' not supported between instances of 'int' and 'str'

d. print (max(list1))

output :-

3

e. print (list (address))

output :-

['B', '-', '6', ',', ',', 'L', 'o', 'd', 'h', 'i', ' ', 'R', 'o', 'a', 'd', '.', ',', 'D', 'e', 'l', 'h', 'i']

f. list2.extend (['e', 5])
print (list2)

output :-

['a', 1, 'z', 26, 'd', 4, 'e', 5]

g. list2.append (['e', 5])
print (list2)

output :-

['a', 1, 'z', 26, 'd', 4, ['e', 5]]

h. names = ['rohan', 'mohan', 'gita']
names.sort(key = len)
print(names)

output :-

['gita', 'rohan', 'mohan']

i. list3 = [(x*2) for x in range(1, 11)]
print(list3)

output :-

[2, 4, 6, 8, 10, 12, 14, 16, 18, 20]

j. del list3[1:]
print(list3)

output :-

[2]

k. list4 = [x+y for x in range(1,5) for y in range(1,5)]
print(list4)

output :-

[2, 3, 4, 5, 3, 4, 5, 6, 4, 5, 6, 7, 5, 6, 7, 8]

l. tuple2[3] = 6

output :-

TypeError :- 'tuple' object doesn't support item assignment.

m. tuple2.append(5)

output :-

AttributeError :- 'tuple' object has no attribute 'append'

n. t1 = tuple2 + (5)

output :-

TypeError :- can only concatenate tuple (not "int") to tuple.

o. ';'.join(tuple1)

output :-

a;e;i;o;u

p. list(zip(['apple','orange'],('red','orange')))

output :-

[('apple','red'),('orange','orange')]

q. dict2['XII']

output :-

['english','physics','chemistry','math']

r. dict2['XII'].append('computer science'),dict2

output :-

{'X': ['Eng','hindi','maths','science'],'XII':['english',
'physics','chemistry','maths','computer science']}

s. 'red' in dict1

output :-

false

t. list(dict1.items())

output :-

[('apple','red'),('mango','yellow'),('orange','orange')]

u. list(dict2.key())

output :-

['X','XII']

v. dict2.get('X1','Name')

output :-

Name

9. dict1.update ({'kiwi': 'green'})
print (dict1)

output :-

{'apple': 'red', 'mango': 'yellow', 'orange': 'orange', 'kiwi': 'green'}

Q9) consider the following three sets, namely vehicles, heavyVehicles, and lightVehicles :

>>> vehicles = {'Bicycle', 'scooter', 'car', 'Bike', 'Truck', 'Bus', 'Rickshaw'}

>>> heavyVehicles = {'Truck', 'Bus'}

>>> lightVehicles = {'Rickshaw', 'scooter', 'Bike', 'Bicycle'}

Determine the output on executing the following statements :

1. lightVehicles = vehicles - heavyVehicles
print (lightVehicles)

output :-

{'Bike', 'scooter', 'Bicycle', 'Rickshaw', 'car'}

2. heavyVehicles = vehicles - lightVehicles
print (heavyVehicles)

output :-

{'Bus', 'car', 'Truck'}

3. averageWeightVehicles = lightVehicles & heavyVehicles
print (averageWeightVehicles)

output :-

{'car'}

4. transport = lightVehicles | heavyVehicles
print (transport)

output :-

{'Bicycle', 'Bus', 'Bike', 'Rickshaw', 'Truck', 'Scooter'}

5. transport.add('car')

print(transport)

output :-

{'car', 'Bicycle', 'Rickshaw', 'Bike', 'Truck', 'scooter', 'Bus'}

6. for i in Vehicles:

print(i)

output :-

Bus
scooter
Bike
Rickshaw
Truck
car
Bicycle

7. len(Vehicles)

output :-

7

8. min(vehicles)

output :-

Bicycle

9. set.union(Vehicles, lightVehicles, heavyVehicles)

output :-

{'car', 'scooter', 'Bicycle', 'Bike', 'Rickshaw', 'Truck', 'Bus'}