

# Programming in Python (CSE 3142)

## MINOR ASSIGNMENT-7: MUTABLE AND IMMUTABLE OBJECTS

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1. Write a function that takes a list of values as input parameter and returns another list without any duplicates.
2. 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  $j \leq i$ .
3. 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.
4. 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)
```

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)
```

5. 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)
```

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)
```

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))
```

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)
```

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)
```

6. 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**.
7. Write a function that takes a number as an input parameter and returns the correspond text in words, for example, on input 452, the function should return 'Four Five Two'. Use a dictionary for mapping digits to their string representation.
8. Given the following inputs, indicate in each case (a) to (w), whether the statements will execute successfully. If, so, give what will be the outcome of execution? Also give the output of print statements (where applicable):

```
address = 'B-6, Lodhi road, Delhi'
list1 = [1, 2, 3]
list2 = ['a', 1, 'z', 26, 'd', 4]
tuple1 = ('a', 'e', 'i', 'o', 'u')
tuple2 = ([2,4,6,8], [3,6,9], [4,8], 5)
dict1 = {'apple': 'red', 'mango': 'yellow', 'orange': 'orange'}
dict2 = {'X': ['eng', 'hindi', 'maths', 'science'], 'XII': ['english', 'physics', 'chemistry', 'maths']}
```

a.

```
list1[3] = 4
```

b.

```
print(list1 * 2)
```

c.

```
print(min(list2))
```

d.

```
print(max(list1))
```

e.

```
print(list(address))
```

f.

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

g.

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

h.

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

i.

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

j.

```
del list3[1:]  
print(list3)
```

k.

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

l.

```
tuple2[3] = 6
```

m.

```
tuple2.append(5)
```

n.

```
t1 = tuple2 +(5)
```

o.

```
','.join(tuple1)
```

p.

```
list(zip(['apple', 'orange'], ('red', 'orange')))
```

q.

```
dict2['XII']
```

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

s.  
`'red' in dict1`

t.  
`list(dict1.items())`

u.  
`list(dict2.keys())`

v.  
`dict2.get('XI', 'None')`

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

9. 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.  
`lytVehicles = vehicles - heavyVehicles`  
`print(lytVehicles)`

2.  
`hvyVehicles = vehicles - lightVehicles`  
`print(hvyVehicles)`

3.  
`averageWeightVehicles = lytVehicles & hvyVehicles`  
`print(averageWeightVehicles)`

4.  
`transport = lightVehicles | heavyVehicles`  
`print(transport)`

5.  
`transport.add('Car')`  
`print(transport)`

6.  
`for i in vehicles:`  
    `print(i)`

7.  
`len(vehicles)`

8.

```
min(vehicles)
```

9.

```
set.union(vehicles, lightVehicles, heavyVehicles)
```