PPL Lab Assignment 5

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- Problem Statement : With a given list L of integers, write a program to print this list L after removing all duplicate values with original order preserved.

- Objectives :

1. To understand List data structure and its methods in Python programming.
2. To learn the loop traversal in Python programming

- Theory :

Python is a clear and powerful object-oriented programming language, comparable to Perl, Ruby, Scheme, or Java.

Some of Python's notable features:

- Uses an elegant syntax, making the programs you write easier to read.
- Is an easy-to-use language that makes it simple to get your program working. This makes Python ideal for prototype

development and other ad-hoc programming tasks, without compromising maintainability.

The most basic data structure in Python is the sequence. Each element of a sequence is assigned a number - its position or index. The first index is zero, the second index is one, and so forth.

The list is a most versatile datatype available in Python which can be written as a list of comma-separated values (items) between square brackets. Important thing about a list is that items in a list need not be of the same type.

Creating a list is as simple as putting different comma-separated values between square brackets.

List is equivalent to arrays in other languages, with the extra benefit of being dynamic in size. In Python, list is a type of container in Data Structures, which is used to store multiple data at the same time. Unlike Sets, the list in Python are ordered and have a definite count.

There are multiple ways to iterate over a list in Python using Loops.

- Algorithm :

1. Take the number of elements in the list and store it in a variable.
2. Accept the values into the list using a for loop and insert them into the list.
3. Use a for loop to traverse through the elements of the list.
4. Use an if statement to check if the element is already there in the list and if it is not there, append it to another list.
5. Print the non-duplicate items of the list.
6. Exit.

- Steps for Implementation :

1. User must enter the number of elements in the list and store it in a variable.
2. User must enter the values of elements into the list.

3. The append function obtains each element from the user and adds the same to the end of the list as many times as the number of elements taken.

4. The for loop basically traverses through the elements of the list and the if statement checks if the element is a duplicate or not.

5. If the element isn't a duplicate, it is added into another list.

6. The list containing non-duplicate items is then displayed.

- Sample Code :

```
a=[]

n= int(input("Enter the number of elements in list:")) for x in range(0,n):

element=int(input("Enter element" + str(x+1) + ":"))
a.append(element)

b = set() unique = [] for x in a:

if x not in b: unique.append(x) b.add(x)

print("Non-duplicate items:") print(unique)
```

- Platform : Ubuntu
- Input :

Enter the Elements of the list : 10 20 20 30 40 40 50

- Output : [10, 20, 30, 40, 50]
- Conclusion : The program helps to understand the working of Lists and loop traversal. It also helps to become familiar with the methods used in Lists.
- FAQs :

1. When to use python lists and when to use tuples, dictionaries or sets.

> Lists are just like dynamic sized arrays, declared in other languages (vector in C++ and ArrayList in Java).

> Tuple is a collection of Python objects much like a list. The sequence of values stored in a tuple can be of any type, and they are indexed by integers. It is immutable.

> Set is an unordered collection of data type that is iterable, mutable and has no duplicate elements. The major advantage of

using a set, as opposed to a list, is that it has a highly optimized method for checking whether a specific element is contained in the set.

> A dictionary is a key:value pair, similar to an associative array found in other programming languages.

2. How to transform Python lists into other data structures?

> Python has inbuilt support for typecasting lists into other data types, for instance the join() function can be used to cast a list into a string, the tuple() function can be used to cast it into a tuple, similarly, a set function also exists, beyond these, the list can be iterated through to cast individual elements.

3. How to clone or copy a list in Python?

> This can be accomplished either by using the list.copy() function in the newer Python versions, or by slicing the list to output the complete list, i.e. list[:].

4. How to count occurrences of a list item in Python?

> The count() method returns the number of times element appears in the list.

5. How to concatenate and sort the lists in Python?

> The '+' operator can be used to concatenate two lists while the list.sort() function is used to sort the list.

- Practice Assignments :

1. Write a Python program to calculate the average of numbers in a given list.

2. Write a Python program to get the largest number from a list.

3. Write a Python program to check a list is empty or not.

4. Write a Python program that takes two lists and returns True if they have at least one common member.

5. Write a Python program to print the numbers of a specified list after removing even numbers from it.

6. Write a Python program to get the difference between the two lists.

```python

# PPL Lab Assignment 5, PG43 Jaynam Modi, G3

# Write a Python Program to input a List and Remove Duplicate

lst = []

for x in input(" > Enter List : ").split(" "):
    if x != "" and int(x) not in lst:
        lst.append(int(x))

print(lst)


# PRACTICE PROBLEMS.

# 1. Python program to calculate Average of numbers in given list.

def average(lst):
    avg = 0.0
    for x in lst:
        avg += x
    avg = avg/len(lst)
    return avg

# 2. Python program to get largest element in list.

def getLargest(lst):
    lrgst = lst[0]
    for x in lst:
        if x > lrgst:
            lrgst = x
    return lrgst

# 3. Python program to check if list is empty.

def checkEmpty(lst):
    return lst == []

# 4. Python program that takes two lists and returns True if they have at least one common member.

def commonMem(lst1, lst2):
    flag = False
    for x in lst1:
        if x in lst2:
            flag = True
    return flag

# 5. Python program to print the numbers of a specified list after removing even numbers from it.

def removeEven(lst):
    newlst = []
    for x in lst:
        if not x%2 == 0:
            newlst.append(x)
    return newlst

# 6. Python program to get the difference between the two lists.

def getDifference(lst1, lst2):
    diff = []
    for x in lst1:
        if x not in lst2:
            diff.append(x)
    for y in lst2:
        if y not in lst1:
            diff.append(y)
    return diff
```

```
1_assignment_3.py
 > Enter List : 10 20 20 30 40 40 50
[10, 20, 30, 40, 50]
u0_a362@localhost:~/github/assignments/PPL$
```