



CourseName: Advance Python Programming

Course code: 22CSH-623

Experiment-2.1

A) Aim: Write a python program to create a list and demonstrate different inbuilt list methods.

Tools/Software Required: Visual Studio Code

Description:

Lists are used to store multiple items in a single variable. Lists are one of 4 built-in data types in Python used to store collections of data, the other 3 are Tuples, Sets, and Dictionaries, all with different qualities and usage. Lists are mutable, meaning, the value of elements of a list can be altered.

Lists are created using square brackets: []

Steps:

Following are the operations that we are going to perform on a list:

1. `append()` - Adds an element at the end of the list
2. `insert()` - Adds an element at the specified position
3. `extend()` - Add the elements of a list (or any iterable), to the end of the current list
4. `copy()` - Returns a copy of the list
5. `remove()` - Removes the first item with the specified value
6. `index()` - Returns the index of the first element with the specified value
7. `pop()` - Removes the element at the specified position
8. `reverse()` - Reverses the order of the list
9. `sort()` - Sorts the list
10. `count()` - Returns the number of elements with the specified value
11. `clear()` - Removes all the elements from the list

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Implementation:

```
fruits = ['apple', 'banana', 'cherry', 'orange', 'mango',
'grapes']
print("Fuits list: ", fruits)
fruits.append(['pineapple'])
print("Appending ['pineapple']: ", fruits)
fruits.insert(2, 'watermelon')
print("Inserting 'watermelon': ", fruits)
fruits.extend(['kiwi', 'papaya'])
print("Extending 'kiwi', 'papaya': ", fruits)
fruits_copy = fruits.copy()
print("Copying one list to another: ", fruits_copy)
fruits.remove(['pineapple'])
print("Removing ['pineapple']: ", fruits)
print("Index of Cherry: ", fruits.index('cherry'))
fruits.pop(2)
print("Pop index 2: ", fruits)
fruits.reverse()
print("Reverse fruits list: ", fruits)
fruits.sort()
print("Sort fruits list in ascending: ", fruits)
fruits.sort(reverse=True)
print("Sorting list in descending: ", fruits)
print("Count 'apple' in list: ", fruits.count('apple'))
fruits.clear()
print("Clear fruits list: ", fruits)
```

Output:

```
$ python slicing_list.py
Fruits list: ['apple', 'banana', 'cherry', 'orange', 'mango', 'grapes']
Inserting 'watermelon': ['apple', 'banana', 'watermelon', 'cherry', 'orange', 'mango', 'grapes', ['pineapple']]
Extending 'kiwi', 'papaya': ['apple', 'banana', 'watermelon', 'cherry', 'orange', 'mango', 'grapes', ['pineapple'], 'kiwi', 'papaya']
Copying one list to another: ['apple', 'banana', 'watermelon', 'cherry', 'orange', 'mango', 'grapes', ['pineapple'], 'kiwi', 'papaya']
Removing ['pineapple']: ['apple', 'banana', 'watermelon', 'cherry', 'orange', 'mango', 'grapes', 'kiwi', 'papaya']
Index of Cherry: 3
Pop index 2: ['apple', 'banana', 'cherry', 'orange', 'mango', 'grapes', 'kiwi', 'papaya']
Reverse fruits list: ['papaya', 'kiwi', 'grapes', 'mango', 'orange', 'cherry', 'banana', 'apple']
Sort fruits list in ascending: ['apple', 'banana', 'cherry', 'grapes', 'kiwi', 'mango', 'orange', 'papaya']
Sorting list in descending: ['papaya', 'orange', 'mango', 'kiwi', 'grapes', 'cherry', 'banana', 'apple']
Count 'apple' in list: 1
Clear fruits list: []
```



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B) Aim: Write a python program to compare two lists.

Tools/Software Required: VS Code, Python

Description:

Python provides multiple ways to compare the two lists. Comparison is the process when the data items are checked against another data item on the list, whether they are the same or not.

The methods of comparing the two lists are given below.

1. The cmp() function
2. The set() function and == operator
3. The sort() function and == operator
4. The collection.counter() function

Steps:

1. Create two lists
2. Compare the two lists using set() and == operator
3. Compare the two lists using sort() and == operator
4. Compare the two lists using collection.counter() function

Implementation:

```
list1 = [1, 2, 3, 4, 5]
list2 = [1, 2, 3, 4, 5]

# 1. Using set() and == operator
if set(list1) == set(list2):
    print("The lists are identical")
else:
    print("The lists are not identical")

# 2. Using sort() and == operator
list1.sort()
list2.sort()
```



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```
if list1 == list2:
    print("The lists are identical")
else:
    print("The lists are not identical")

# 3. Using collection.counter() function
from collections import Counter
if Counter(list1) == Counter(list2):
    print("The lists are identical")
else:
    print("The lists are not identical")
```

Output:

```
$ python compare_lists.py
The lists are identical
The lists are identical
The lists are identical
```



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C) Aim: Write a python program for performing list slicing.

Tools/Software Required: VS Code, Python

Description:

List slicing is a technique to access a subset of elements from a list.

The syntax of list slicing is:

list[start:end:step]

start: The index of the first element in the subset. If start is not specified, the default value is 0.

end: The index of the last element in the subset. If end is not specified, the default value is the length of the list.

step: The number of elements to skip between each element in the subset. If step is not specified, the default value is 1.

Steps:

1. Create a list of fruits
2. Slice the list to get the first 3 fruits
3. Slice the list to get the last 3 fruits
4. Slice the list to get the middle 3 fruits
5. Slice the list to get the first 3 fruits in reverse order
6. Slice the list to get the last 3 fruits in reverse order
7. Slice the list to get the middle 3 fruits in reverse order

Implementation:

```
fruits = ['apple', 'banana', 'cherry', 'orange', 'mango',  
'grapes']  
print("Fuits list: ", fruits)  
  
print("First 3 fruits: ", fruits[0:3])  
print("Last 3 fruits: ", fruits[-3:])  
print("Middle 3 fruits: ", fruits[2:5])
```



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```
print("First 3 fruits in reverse order: ",  
      fruits[2:5:-1])  
print("Last 3 fruits in reverse order: ", fruits[-3::-1])  
print("Middle 3 fruits in reverse order: ",  
      fruits[4:1:-1])
```

Output:

```
$ python slicing_list.py  
Fuits list: ['apple', 'banana', 'cherry', 'orange', 'mango', 'grapes']  
First 3 fruits: ['apple', 'banana', 'cherry']  
Last 3 fruits: ['orange', 'mango', 'grapes']  
Middle 3 fruits: ['cherry', 'orange', 'mango']  
First 3 fruits in reverse order: []  
Last 3 fruits in reverse order: ['orange', 'cherry', 'banana', 'apple']  
Middle 3 fruits in reverse order: ['mango', 'orange', 'cherry']
```