

**List Comprehension** 

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# PYTHON FOR COMPUTATIONAL PROBLEM SOLVING List Comprehension



#### Introduction

- List comprehension is a concise way of defining and creating a list.
- It is used to create functionality within a single line of code.
- Return value is always a new list obtained by evaluating the expression in the context of for and if clauses which follows it.
- List comprehension is faster in processing than a list using for loop.

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#### Syntax:

list = [expression for <variable> in <iterable> [if condition]]

This is equivalent to:

for variable in iterable : if condition: expression

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#### Consider the code:

The same can be done with a single line of code using list comprehension.

```
print([x+y for x in m for y in n])
Output:
5, 6, 7, 6, 7, 8, 7, 8, 9]
[5, 6, 7, 6, 7, 8, 7, 8, 9]
(1+4),(1+5),(1+6)....
```

### **List Comprehension**



Consider an example where we want to calculate a list with the cube of the first 10 natural numbers:

# **Examples**



Example 2: To print the last letter of every word in the list.

```
Words = ["hi","how","are","you"]
items = [ word[-1] for word in Words ]
print (items)
```

#### Output:

# **Examples**



Example 3: To print the common numbers in two lists.

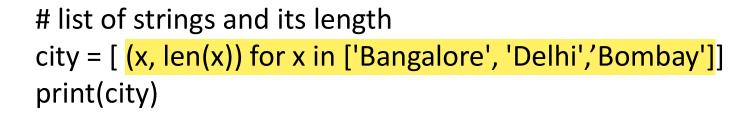
$$list2 = [2, 3, 4, 5]$$

common\_num = [a for a in list1 for b in list2 if a == b]
print(common\_num)

#### Output:

# **Examples**





#### Output:

[('Bangalore', 9), ('Delhi', 5), ('Bombay', 6)]



## **Examples**



Example 5: To print the squares of first 10 odd numbers.

list1=[
$$x*x$$
 for x in range(1,11)]  
list2=[ $x$  for x in list1 if  $x%2$ != 0]  
print(list2)

#### Output:

[1, 9, 25, 49, 81]

### List comprehension –Practice programs



#### 1. Using list comprehension find the transpose of a given matrix.

#### Output:

# PYTHON FOR COMPUTATIONAL PROBLEM SOLVING List comprehension —Practice programs



2. Using list comprehension print all the numbers which are divisible by both 2 and 5 in the range of 0 to 100

```
num_list = [y for y in range(100) if y % 2 == 0 if y % 5 == 0] #Use of
nested if
print(num_list)
```

#### **Output:**

[0, 10, 20, 30, 40, 50, 60, 70, 80, 90]

# List comprehension —Practice programs



3. Using list comprehension, find all of the numbers that have a 6 in them.

```
nums=input("Enter the number")
List_with_6 = [num for num in nums if "6" in str(num)]
print(List_with_6)
```

#### **Output:**

Enter the number 76548 ['6']

## List comprehension –Practice programs



4. Using list comprehension count the number of spaces in a string

```
string=input("Enter the string: ")
len_spaces = len([char for char in string if char == " "])
print("The length of the spaces is::",len_spaces)
```

#### Output:

Enter the string: This is a test string

The length of the spaces is:: 4

## List comprehension –Practice programs



5.Using list comprehension, remove all of the vowels present in the input string.

```
string=input("Enter the string::")
str_no_vowel = "".join([char for char in string.lower() if char not in
["a","e","i","o","u"]])
print("The string without vowel::",str_no_vowel)
Output:
```

Enter the string:: All welcome

The string without vowel:: Il wlcm



## **THANK YOU**

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