

# Questions on map(), filter() and reduce() Function

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**Credits** W3School for questions

**1. Write a Python program to triple all numbers of a given list of integers. Use Python map.**

```
In [16]: list_int = [i for i in range(1,11)]  
list_int
```

```
Out[16]: [1, 2, 3, 4, 5, 6, 7, 8, 9, 10]
```

```
In [17]: def int_trippler(l):  
         return list(map(lambda x : x*3, l))  
  
int_trippler(list_int)
```

```
Out[17]: [3, 6, 9, 12, 15, 18, 21, 24, 27, 30]
```

**2. Write a Python program to add three given lists using Python map and lambda.**

```
In [18]: list1 = [i for i in range(1,10)]  
list1
```

```
Out[18]: [1, 2, 3, 4, 5, 6, 7, 8, 9]
```

```
In [19]: list2 = [i for i in range(11,20)]  
list2
```

```
Out[19]: [11, 12, 13, 14, 15, 16, 17, 18, 19]
```

```
In [20]: list3 = [i for i in range(21,30)]  
list3
```

```
Out[20]: [21, 22, 23, 24, 25, 26, 27, 28, 29]
```

```
In [21]: def list_addition(l1, l2, l3):  
         return list(map(lambda x,y,z : x+y+z, l1,l2,l3))  
  
list_addition(list1, list2, list3)
```

```
Out[21]: [33, 36, 39, 42, 45, 48, 51, 54, 57]
```

**3. Write a Python program to listify the list of given strings individually using Python map.**

```
In [11]: l = ["MY", "NAME", "IS", "PYTHON"]  
  
def listifier(input_list):  
    return list(map(list, input_list))  
  
listifier(l)
```

```
Out[11]: [['M', 'Y'], ['N', 'A', 'M', 'E'], ['I', 'S'], ['P', 'Y', 'T', 'H', 'O', 'N']]
```

**4. Write a Python program to create a list containing the power of said number in bases raised to the corresponding number in the index using Python map.**

```
In [15]: base_list = [i for i in range(10,101,10)]  
base_list
```

```
Out[15]: [10, 20, 30, 40, 50, 60, 70, 80, 90, 100]
```

```
In [23]: index_list = [i for i in range(1,11)]
         index_list
```

```
Out[23]: [1, 2, 3, 4, 5, 6, 7, 8, 9, 10]
```

```
In [24]: def custom_power(base, index):
         return list(map(pow, base, index))

         custom_power(base_list, index_list)
```

```
Out[24]: [10,
          400,
          27000,
          2560000,
          312500000,
          46656000000,
          8235430000000,
          1677721600000000,
          387420489000000000,
          1000000000000000000]
```

## 5. Write a Python program to square the elements of a list using map() function.

```
In [25]: list_int = [i for i in range(1,11)]
         list_int
```

```
Out[25]: [1, 2, 3, 4, 5, 6, 7, 8, 9, 10]
```

```
In [26]: def square_calc(l):
         return list(map(lambda x : x**2, l))

         square_calc(list_int)
```

```
Out[26]: [1, 4, 9, 16, 25, 36, 49, 64, 81, 100]
```

## 6. Write a Python program to convert all the characters in uppercase and lowercase and eliminate duplicate letters also sort list from a given sequence. Use map() function.

```
In [36]: list_char = ['a', 'B', 'c', 'd', 'A', 'P', 'p', 'z']
         def case_changer_dup_removal(l):
             return sorted(list(set(map(lambda x : (str(x).lower(), str(x).upper()), l))))

         case_changer_dup_removal(list_char)
```

```
Out[36]: [('a', 'A'), ('b', 'B'), ('c', 'C'), ('d', 'D'), ('p', 'P'), ('z', 'Z')]
```

## 7. Write a Python program to add two given lists and find the difference between lists. Use map() function.

```
In [37]: list1 = [i for i in range(1,11)]
         list1
```

```
Out[37]: [1, 2, 3, 4, 5, 6, 7, 8, 9, 10]
```

```
In [38]: list2 = [i for i in range(10,21)]
         list2
```

```
Out[38]: [10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20]
```

```
In [44]: def list_add_sub(l1, l2):
         return list(map(lambda x,y : (x+y , y-x), l1, l2))

         list_add_sub(list1, list2)
```

```
Out[44]: [(11, 9),
          (13, 9),
          (15, 9),
          (17, 9),
          (19, 9),
          (21, 9),
          (23, 9),
          (25, 9),
          (27, 9),
          (29, 9)]
```

## 8. Write a Python program to convert a given list of integers in a list and tuple of strings.

```
In [45]: l_int = [i for i in range(1,11)]
         l_int
```

```
Out[45]: [1, 2, 3, 4, 5, 6, 7, 8, 9, 10]
```

```
In [47]: def stringify_list(l):
         return list(map(lambda x : str(x), l))

         stringify_list(l_int)
```

```
Out[47]: ['1', '2', '3', '4', '5', '6', '7', '8', '9', '10']
```

```
In [48]: def stringify_list_into_tuple(l):
         return tuple(map(lambda x : str(x), l))

         stringify_list_into_tuple(l_int)
```

```
Out[48]: ('1', '2', '3', '4', '5', '6', '7', '8', '9', '10')
```

## 9. Write a Python program to create a new list taking specific elements from a tuple and convert a string value to integer.

```
In [123... employee_data = [('Krish Naik', '15/05/1988', '65kg'), ('Sudhanshu Kumar', '17/05/1986', '77kg'),
                    ('Navin Reddy', '16/02/1989', '69kg'), ('Sunny Savita', '25/09/1990', '65kg')]
```

```
In [124... employee_name = list(map(lambda x : x[0], employee_data))
         employee_name
```

```
Out[124]: ['Krish Naik', 'Sudhanshu Kumar', 'Navin Reddy', 'Sunny Savita']
```

```
In [125... employee_dob = list(map(lambda x : x[1], employee_data))
         employee_dob
```

```
Out[125]: ['15/05/1988', '17/05/1986', '16/02/1989', '25/09/1990']
```

```
In [126... employee_weight = list(map(lambda x : int(x[2][:2]), employee_data))
         employee_weight
```

```
Out[126]: [65, 77, 69, 65]
```

## 10. Write a Python program to compute the square of first N Fibonacci numbers, using map function and generate a list of the numbers.

```
In [11]: import itertools as it

         def fib(x=0, y=1):
             yield x
             while True:
                 yield y
                 x, y = y, x + y
         no_of_iterations = 12
         l = list(it.islice(fib(), no_of_iterations))

         square_fibonacci = list(map(lambda x : x **2, l))
         square_fibonacci
```

```
Out[11]: [0, 1, 1, 4, 9, 25, 64, 169, 441, 1156, 3025, 7921]
```

## 11. Write a Python program to compute the sum of elements of a given array of integers, use map() function.

```
In [19]: l_int = [i for i in range(1,101)]
```

```
In [20]: from array import array as arr
         def add(num_array):
             sum = 0
             for i in num_array:
                 sum += i
```

```

    return sum

num = arr('i', l_int)

num_array = list(map(int, num))
add(num_array)

```

Out[20]: 5050

## 12. Write a Python program to find the ration of positive numbers, negative numbers and zeroes in an array of integers

```

In [31]: num = arr('i', [1,2,-2,-3,0,5,6,7,8,-7,0,-5,99,-101,-89,0,89])
len(num)

```

Out[31]: 17

```

In [38]: def ratio_calc(num):
    n_pos = n_neg = n_zero = 0
    n = len(num)
    for x in num:
        if x == 0:
            n_zero += 1
        elif x > 0:
            n_pos += 1
        elif x < 0:
            n_neg += 1

    return "ratio of positive numbers: {}, negative numbers: {} and zeroes: {}".format(round(n_pos/n,2),
                                                                                       round(n_neg/n,2),
                                                                                       round(n_zero/n,2)
                                                                                       )

int_array = list(map(int, num))
ratio_calc(int_array)

```

Out[38]: 'ratio of positive numbers: 0.47, negative numbers: 0.35 and zeroes: 0.18'

## 13. Write a Python program to count the same pair in two given lists. use map() function.

```

In [54]: import random
l1 = [random.randrange(1,10) for i in range(11)]
l1

```

Out[54]: [4, 2, 6, 4, 3, 9, 1, 6, 2, 4, 7]

```

In [58]: l2 = [random.randrange(1,10) for i in range(11)]
l2

```

Out[58]: [7, 2, 6, 6, 9, 2, 2, 1, 2, 8, 8]

```

In [59]: from operator import eq

def count_same_pair(list1, list2):
    return sum(map(eq, l1, l2))

count_same_pair(l1, l2)

```

Out[59]: 3

## 14. Write a Python program to interleave two given list into another list randomly using map() function.

```

In [62]: import random
l1 = [random.randint(1,20) for i in range(11)]
l2 = [random.randint(1,20) for i in range(11)]

```

```

In [63]: print(l1)
print(l2)

```

```

[16, 17, 20, 4, 14, 17, 8, 8, 4, 1, 13]
[5, 14, 11, 1, 1, 16, 15, 3, 18, 20, 18]

```

```
In [69]: def interleave_list(list1, list2):
        """
        This functions adds two list elements in random sequence
        """
        return list(map(next, random.sample([iter(list1)]*len(list1) + [iter(list2)]*len(list2), len(list1)+len(list2))))

interleave_list(l1, l2)

Out[69]: [16, 17, 20, 4, 14, 5, 14, 11, 17, 8, 8, 4, 1, 1, 16, 1, 13, 15, 3, 18, 20, 18]
```

### 15. Write a Python program to split a given dictionary of lists into list of dictionaries using map function.

```
In [74]: dict1 = {"Name" : ["Krish", "Sudhanshu", "Navin"], "Surname" : ["Naik", "Kumar", "Reddy"]}

In [76]: def dict_list_of_dict(dict1):
        return list(map(dict, zip(*[(key, val) for val in value] for key, value in dict1.items()))))
dict_list_of_dict(dict1)

Out[76]: [{'Name': 'Krish', 'Surname': 'Naik'},
{'Name': 'Sudhanshu', 'Surname': 'Kumar'},
{'Name': 'Navin', 'Surname': 'Reddy'}]
```

### 16. Write a Python program to convert a given list of strings into list of lists using map function.

```
In [78]: l_courses = ["DL", "ML", "NLP", "CV"]

def list_of_list(l):
    return list(map(list, l))

list_of_list(l_courses)

Out[78]: [['D', 'L'], ['M', 'L'], ['N', 'L', 'P'], ['C', 'V']]
```

### 17. Write a Python program to convert a given list of tuples to a list of strings using map function.

```
In [83]: mentors = [("Krish", "Naik"), ("Sudhanshu", "Kumar"), ("Navin", "Reddy"), ("Hitesh", "Choudhary")]

def ListofTuples_to_ListofStrings(l):
    return list(map(lambda x : x[0] + " " + x[1],l))

ListofTuples_to_ListofStrings(mentors)

Out[83]: ['Krish Naik', 'Sudhanshu Kumar', 'Navin Reddy', 'Hitesh Choudhary']
```

### 18. Write a Python program to filter a list of integers using filter function.

```
In [106]: lint = [i for i in range(1,11)]

def even_filter(l):
    return list(filter(lambda x : x % 2 == 0 , l))

even_filter(lint)

Out[106]: [2, 4, 6, 8, 10]

In [107]: def odd_filter(l):
        return list(filter(lambda x : x % 2 != 0 , l))

odd_filter(lint)

Out[107]: [1, 3, 5, 7, 9]
```

### 19. Write a Python program to find intersection of two given arrays using Filter function.

```
In [104]: l1 = [1,2,3,4,5,6,7,8,9,10]
l2 = [2,4,6,8,11,12]

def intersection(list1, list2):
```

```

    return list(filter(lambda x : x in list1 , list2))

intersection(l1, l2)

```

Out[104]: [2, 4, 6, 8]

## 20. Write a Python program to count the even, odd numbers in a given array of integers using filter function.

```

In [93]: import random
def count_Even_odd(l) :
    even = len(list(filter(lambda x: x % 2 == 0, l)))

    print("Count of Even number in given list is: ", even)
    print("Count of odd number in given list is: ", len(l) - even)

list_num = [random.randrange(1,50) for i in range(10)]
list_num

```

Out[93]: [37, 12, 16, 23, 43, 26, 32, 4, 27, 35]

In [94]: count\_Even\_odd(list\_num)

```

Count of Even number in given list is:  5
Count of odd number in given list is:  5

```

## 21. Write a Python program to find palindromes in a given list of strings using filter function.

```

In [103... l_word = ['php', 'w3r', 'Python', 'abcd', 'Java', 'aaa']

def palindrome_filter(l):
    return list(filter(lambda x : x if x == x[::-1] else '', l))

palindrome_filter(l_word)

```

Out[103]: ['php', 'aaa']

## 22. Write a Python program to find all anagrams of a string in a given list of strings using filter function.

```

In [108... l = ['wxyz', 'wxye', 'zywx', 'zxew', 'yzxw']

from collections import Counter

def anagrams_filter(main_string, list_words):
    return list(filter(lambda x: x if Counter(main_string) == Counter(x) else '', list_words))

anagrams_filter("wxyz", l)

```

Out[108]: ['wxyz', 'zywx', 'yzxw']

## 23. Write a Python program to calculate the product of a given list of numbers using reduce function.

```

In [121... from functools import reduce

l = [i for i in range(1,11)]

def product_reduce(l_int):
    return reduce(lambda x,y : x*y, l_int)

product_reduce(l)

```

Out[121]: 3628800

## 24. Write a Python program to calculate the sum of numbers in a given list of numbers using reduce function.

```

In [122... l_num = [i for i in range(10, 21)]

def sum_reduce(l_int):

```

```
    return reduce(lambda x,y : x+y, l_int)

sum_reduce(l_num)
```

Out[122]: 165

## 25. Write a Python program to multiply all the numbers in a given list using reduce function.

```
In [118... l = [4, 3, 2, 2, -1, 18]
l1 = [2.2, 4.12, 6.6, 8.1, 8.3]

def multiply_reduce(l_int):
    return round(reduce(lambda x,y : x*y, l_int), 2)
```

```
In [119... multiply_reduce(l)
```

Out[119]: -864

```
In [120... multiply_reduce(l1)
```

Out[120]: 4021.86