

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

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W3School for questions

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

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

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

```
In [2]: def int_trippler(l1):
    return list(map(lambda x: x*3, l1))

int_trippler(list_int)
```

```
Out[2]: [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 [3]: list1 = [i for i in range(1, 10)]
list1
```

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

```
In [4]: list2 = [i for i in range(11, 20)]
list2
```

```
Out[4]: [11, 12, 13, 14, 15, 16, 17, 18, 19]
```

```
In [5]: list3 = [i for i in range(21, 30)]
list3
```

```
Out[5]: [21, 22, 23, 24, 25, 26, 27, 28, 29]
```

```
In [6]: 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[6]: [33, 36, 39, 42, 45, 48, 51, 54, 57]
```

**3) 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 [7]: base_list = [i for i in range(10, 101, 10)]
base_list
```

```
Out[7]: [10, 20, 30, 40, 50, 60, 70, 80, 90, 100]
```

```
In [8]: index_list = [i for i in range(1, 11)]
index_list
```

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

```
In [9]: def custom_power(base, index):
         return list(map(pow, base, index))

custom_power(base_list, index_list)
```

```
Out[9]: [10,
        400,
        27000,
        2560000,
        312500000,
        4665600000,
        823543000000,
        1677721600000000,
        387420489000000000,
        1000000000000000000000000]
```

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

```
In [10]: list_int = [i for i in range(1, 11)]
list_int
```

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

```
In [11]: def square_calc(l):
           return list(map(lambda x: x ** 2, l))

square_calc(list_int)
```

```
Out[11]: [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 [12]: list_char = ["a", "B", "c", "d", "A", "P", "p", "z"]
def case_changer_dup_remover(l):
    return sorted(list(set(map(lambda x: (str(x).lower(), str(x).upper()), l)))))

case_changer_dup_remover(list_char)
```

```
Out[12]: [('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 [13]: list1 = [i for i in range(1, 11)]
list1
```

```
Out[13]: [1, 2, 3, 4, 5, 6, 7, 8, 9, 10]
```

```
In [14]: list2 = [i for i in range(10, 21)]
list2
```

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

```
In [15]: def list_add_sub(l1, l2):
    return list(map(lambda x, y: (x+y, y-x), l1, l2))

list_add_sub(list1, list2)
```

```
Out[15]: [(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 [16]: l_int = [i for i in range(1, 11)]
l_int
```

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

```
In [17]: def stringify_list(l):
    return list(map(lambda x: str(x), l))

stringify_list(l_int)
```

```
Out[17]: ['1', '2', '3', '4', '5', '6', '7', '8', '9', '10']
```

```
In [18]: def stringify_list_into_tuple(l):
    return tuple(map(lambda x: str(x), l))

stringify_list_into_tuple(l_int)
```

```
Out[18]: ('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 [19]: 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 [20]: employee_name = list(map(lambda x: x[0], employee_data))
employee_name

Out[20]: ['Krish Naik', 'Sudhanshu Kumar', 'Navin Reddy', 'Sunny Savita']

In [21]: employee_dob = list(map(lambda x: x[1], employee_data))
employee_dob

Out[21]: ['15/05/1988', '17/05/1986', '16/02/1989', '25/09/1990']

In [22]: employee_weight = list(map(lambda x: int(x[2][:2]), employee_data))
employee_weight

Out[22]: [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 [23]: 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[23]: [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 [24]: l_int = [i for i in range(1, 101)]

In [25]: 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[25]: 5050
```

**12) Write a python program to find the ration of postive numbers, negative number and zeros in an array**

```
In [26]: num = arr("i", [1, 2, -2, -3, 0, 5, 6, 7, 8, -7, 0, -5, 99, -101, -89, 0, 89])
len(num)
```

```
Out[26]: 17
```

```
In [27]: 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(n_pos/n, n_neg/n, n_zero/n)

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

```
Out[27]: '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 [28]: import random
l1 = [random.randrange(1, 10) for i in range(11)]
l1
```

```
Out[28]: [7, 6, 4, 7, 9, 7, 1, 2, 6, 6, 9]
```

```
In [29]: l2 = [random.randrange(1, 10) for i in range(11)]
l2
```

```
Out[29]: [8, 2, 4, 8, 5, 2, 3, 8, 5, 9, 4]
```

```
In [30]: from operator import eq

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

count_same_pair(l1, l2)
```

```
Out[30]: 1
```

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

```
In [31]: import random
l1 = [random.randint(1, 20) for i in range(11)]
l2 = [random.randint(1, 20) for i in range(11)]
```

```
In [32]: print(l1)
print(l2)
```

```
[5, 13, 11, 14, 7, 6, 18, 15, 5, 16, 14]
[20, 4, 18, 17, 10, 4, 18, 13, 20, 7, 14]
```

```
In [33]: 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)-1)))

interleave_list(l1, l2)
```

```
Out[33]: [5,
13,
20,
4,
11,
14,
18,
7,
6,
17,
18,
10,
4,
18,
15,
5,
13,
16,
20,
7,
14,
14]
```

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

```
In [34]: dict1 = {"Name" : ["Krish", "Sudhanshu", "Navin"], "Surname" : ["Naik", "Kumar", "Reddy"]}
```

```
In [35]: 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[35]: [{"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 [36]: l_courses = ["DL", "ML", "NLP", "CV"]

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

```
list_of_list(l_courses)
Out[36]: [['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 [37]: 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[37]: ['Krish Naik', 'Sudhanshu Kumar', 'Navin Reddy', 'Hitesh Choudhary']
```

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

```
In [38]: 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[38]: [2, 4, 6, 8, 10]
```

```
In [39]: def odd_filter(l):
    return list(filter(lambda x: x % 2 != 0, l))

odd_filter(lint)
Out[39]: [1, 3, 5, 7, 9]
```

**19) Write a Python program to find intersection of two arrays using dFilter function.**

```
In [40]: 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[40]: [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 [41]: 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 if : ", even)
        print("Count of Odd number in given list if : ", len(l) - even)

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

```

Out[41]: [30, 42, 11, 39, 46, 29, 41, 45, 3, 30]

In [42]: `count_Even_Odd(list_num)`

```

Count of Even number in given list if : 4
Count of Odd number in given list if : 6

```

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

In [43]: `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[43]: ['php', 'aaa']

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

In [44]: `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[44]: ['wxyz', 'zywx', 'yzxw']

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

In [45]: `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[45]: 3628800

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

```
In [46]: 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[46]: 165
```

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

```
In [51]: l = [4, 3, 2, 2, -1, 10]  
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 [52]: multiply_reduce(l)
```

```
Out[52]: -480
```

```
In [53]: multiply_reduce(l1)
```

```
Out[53]: 85193.86
```