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Programming and Data Structures with Python Lab6 Implementation of Map, Filter and Reduce Functions

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[1]:
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# Question 1
"""Write a program to implement MAP function. Find the square root of a list of
numbers [1, 2, 4, 6] using map and sqrt functions. Check the answer against␣
 ↪your user
defined function mymap()."""
import math
lst = [1, 2, 3, 4, 12, 13, 14, 20]
ls2 = list(map(math.sqrt,lst))
print(ls2)
```

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[1.0, 1.4142135623730951, 1.7320508075688772, 2.0, 3.4641016151377544,
3.605551275463989, 3.7416573867739413, 4.47213595499958]
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[2]:
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# Question 2
"""Write a program to implement FILTER function. Filter all upper case letters␣
 ↪in a
list ['x', 'Y', '2', '3', 'Z', 'b'] using filter function. Check the answer␣
 ↪against your user define
function myfilter()."""

def myfilter(val):
    if val.isupper():
        return True
    else:
        return False
lst = ['x', 'Y', '2', '3', 'Z', 'b']
ls2 = list(filter(myfilter, lst))
ls2
```

[2]:
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['Y', 'Z']
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[3]:
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# Question 3
"""Write a program to create a lambda function that takes two characters and
concatenates them. Now, apply this function inside REDUCE function that will␣
 ↪reduce the list
of characters ['a', 'b', 'c', d'] with the intial value 'x'."""
from functools import reduce
ls1 = [1, 2, 3, 4, 5, 6, 7, 8, 9, 10]
ls2 = reduce(lambda x, y: x + y, ls1)
print(ls2)
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[4]:
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# Question4
"""Imagine an accounting routine used in a book shop. It works on a list with
sublists, which look like this: """

book_shop = [[34587, "Learning Python, Mark Lutz", 4, 40.95],
             [98762, "Programming Python, Mark Lutz", 5, 56.80],
             [77226, "Head First Python, Paul Barry", 3, 32.95],
              [88221, "Einführung in Python3, Bernd Klein", 3, 24.99]]
"""Write a Python program, which returns a list with 2-tuples. Each tuple␣
 ↪consists of an order
number and the product of the price per items and the quantity. The product␣
 ↪should be
decreased by RS 10 if the value of the order is smaller than RS 100.00. Write a␣
 ↪Python
program using lambda and map functions."""

result = list(map(lambda x: (x[0], x[2] * x[3] if x[2] * x[3] >= 100 else x[2]␣
 ↪* x[3] - 10), book_shop))

print(result)
```

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[(34587, 163.8), (98762, 284.0), (77226, 88.85000000000001), (88221, 64.97)]
```
