# Introduction to Computer Science and Programming 1

# CSCI120

### Chapter4: Functions

### Assignment 4

**Note:** This document has been designed and developed as part of an initiative for creating an OER (Open Education Resource) package for the course CSCI 120 at Columbia College.

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Last Modified: May 2022

# Requirements

* Please use meaningful name for your variables and functions
* Try to reuse your solutions as much as possible.
* For each of the following problem you need to
  + Define a function (for instance function1)
  + Add comments for the functions as discussed in the lecture
  + Mention the list of input parameters
  + Mention what type of output does the function has
  + Write a test function for instance testFunction1
  + In the test function, for all test cases you have already written for your algorithm, write a function call inside the main function
  + Call the test function in the main function.
* Define all the functions in one file (all in one)
* Define the function header
* Define a main function
* Call the functions inside the main function
* If the function you implement for a question is big, please try to break down to multiple functions.
* Do not use methods, functions, statements that we have not covered in the previous lectures.

##Problem 1

print(“Problem1--------------------------------------------”)

Python code for problem 1

##Problem 2

print(“Problem2--------------------------------------------”)

Python code for problem 2

If it is a group assignment, please add the information here

|  |  |  |
| --- | --- | --- |
| **# of Students in the Group:** |  | |
|  |  |  |
| **Student 1** | *First name, last name* | *Student-ID* |
| **Student 2** | *First name, last name* | *Student-ID* |
| **Student 3** | *First name, last name* | *Student-ID* |
| **Student 4** | *First name, last name* | *Student-ID* |

**Problem1**

* Design and implement a function with an input parameter which is a positive number and prints and returns the sum of the number’s digits. For instance if the number is 123 the algorithm returns 6 which is the result of 1+2+3.

# Problem2

* Design and implement a function with one parameter which is an integer and finds the next prime number which is bigger than the given input parameter and returns it.
* Suggestion: Define and implement a function called isPrime which checks whether a number is prime or not and then reuse it in this problem.

# Problem3

* Design and implement a function with two input parameters, A and B. The functions then calculates the result of the floor division of A over B (A//B). You are not allowed to use the floor division operator. Look at here: <https://simple.wikipedia.org/wiki/Division_(mathematics)>
* For instance the function for 20 and 6 will return 3.

# Problem4

* Design and implement a function with no input parameter which reads a number from input (like 123). Only non-decimal numbers are valid (floating points are not valid). The number entered by the user should not be divisible by 10 and if the user enters a number that is divisible by 10 (like 560), it is considered invalid and the application should keep asking until the user enters a valid input. Once the user enters a valid input, the program calculates the reverse of the input number (for 153, the reverse is 351) and prints the result and returns the results.

# Problem5

* Write a function called printSubLists which receives two number A and B as its parameters:
* First prints all numbers between A and B (A and B not included), which are divisible to both 3 and 5.
* Then prints all numbers between A and B (A included by B not included), which are divisible by either 6 or 7.
* Finally prints all numbers between A and B (A and B both included), which are not divisible by 3.
* Hint: Design a function for each sub problem and then call them inside the printSubLists function.

**Good Luck ☺**