**CSE 101 - Introduction to Programming**

**Lab 6**

**Instructions:**

1. **Rename this file as Lab6\_Solutions\_2018xxx.**
2. **Create python files with the names mentioned along with the question.**
3. **Put all the files in a folder named CSE101\_Lab6\_2018xxx and zip it and upload.**

**Q1. A robot moves in a two dimensional plane starting from the original position (0,0) by default. The program must confirm the same from the user. In case user wants to specify a different start point the program must update that.**

**The robot can move toward *UP, DOWN, LEFT and RIGHT*. There are numbers after the direction, which are steps which the robot travels in that direction. The user gives information of the movement one by one in no specific order.**

**In case the user gives a wrong input the program must prompt it to give the correct input. In case user inputs *STOP*, the program must then return initial, final coordinates of the robot and the distance from the travelled.**

**Write a program for the described scenario. Name the file robot\_2018xxx.py**

A sample trace of robot movement is shown as the following:

UP 5

DOWN 3

LEFT 3

RIGHT 2

UP 1

RIGHT 5

The output of this example will be 5 units with the initial position as (0,0) and final position (4,3).

***Q1.1 Optional Ungraded Question***

*Can the steps described be represented in a graphical form? If yes, create your own program for the same with necessary assumptions. Name the file robotG\_2018xxx.py. How much time did it take you to solve and write the code for this problem?*

**Q2. Write a program which accepts a hexadecimal number as its input and then checks whether the number is divisible by 7 or not. If the number is divisible by 7 then print a message and the quotient is also printed in hexadecimal format. Name the file hexDiv7\_2018xxx.py**

***Q2.1 Optional Ungraded Question***

*Is there a maximum value for the number that can be accepted by your program written using Python3? If there is any, what is it dependent on? How much time did it take you to solve and write the code for this problem?*

**Q3. Write a function that computes the value of ab+abab+ababab+abababab+...upto n terms. The values of n, a and b are taken as an input from the user. What are the conditions that may need to be checked here with respect to a, b and n? In case of invalid input the function returns the string INV. Name the file Computation\_2018xxx.py**

***Q3.1 Optional Ungraded Question***

*Create a test file to test your code. Name the file Computation\_test\_2018xxx.py. Make sure you add all the cases where the input may be invalid. How much time did it take you to solve and write the code for this problem?*

**Q4. Write a function with the following description:**

***FindNumOccurrence (string1, string2), which r*eturns NumberX if string1 occurs X times in string2. If the string1 is found at the very beginning of string2 then the starting alphabet must be in capital. Any other occurrences of the string1 in string2 will be case insensitive. Both the strings can contain any character but string1 must start with an alphabet. Name the file stringSearchX\_2018xxx.py.**

***Q4.1 Optional Ungraded Question***

*What validity conditions need to be checked here? Create a test file to test your code.* Name the file stringSearchX\_test\_2018xxx.py.*Make sure you add all the cases where the input may be invalid. How much time did it take you to solve and write the code for this problem?*