Independent University, Bangladesh (IUB)

Course No.:	CSC301	Year:	2021
Section No.:	03	Semester:	Spring
Course Title:	Finite Automata & Theory of Computation	Exam:	Assignment 03
Instructor:	M Ashraful Amin, PhD	Total Marks:	10
School:	SETS	Due Date:	
Department:	CSE	Location:	Online

Name: ID:

For this course we will use the concept of language, string, and symbols. In programming language for example C++, a symbol is represented as characters (declared as "char a;"), likewise a sequence of character or symbol is represented as character array (declared as "char s[100];"). For this assignment you have to write some basic functions in C++ that you may need for future assignment and understanding of this course.

for this assignment you **cannot** use the string library, you have to implement everything from the scratch to understand how the string and character manipulation works.

1. Your gives you a string return the length of that string
2. Your gives you a symbol or a character and a string of character, you have to tell how many times the character occurs in the string and which locations.
3. User gives you two strings you have to tell if the first string contains the second string or not, it the second string is in the first string (is a substring) then which are the locations that the second string is present in the first string.
4. Using answer of question '3' implement the concept of "prefix", "suffix"
5. Two strings are joined using the function called "concatenation", implement that as a function.
6. Write a function that reverses a string
7. Write a function that checks if two strings are equal o not
8. Assume that a string *'s'* has two substrings *'w'* and *'x',* and we can say that $s = wx$, meaning, s is concatenation of w and x, and w is a prefix of s and x is a suffix of s. Then it is said that the following is true. $(wx)^R = x^R w^R$
   For example: if the user gives the string "DogCat" *(w = "Dog" and x = "Cat")*,
   Then: $(wx)^R = x^R w^R$
   ⇨ $("DogCat")^R = ("Cat")^R("Dog")^R$
   Because: $(DogCat)^R = taCgoD$ and
   $(Cat)^R(Dog)^R = taCgoD$

Now write a code to prove this concept for any given string.