National University of Computer and Emerging Sciences, Lahore Campus

Course:	COAL Lab	Course Code:	EL-213
Program:	BS (Computer Science)	Semester:	Spring2018
Duration:	150 Minutes	Total Marks:	40
Paper Date:	04-May-2018	Weight	40%
Section:	All	Page(s):	1
Exam:	Final Term	Roll. No.	

Instructions:

1. Understanding the question paper is also part of the exam, so do not ask any clarification.
2. Make sure to switch off your mobile phones before the Exam starts.
3. No USB's are allowed. No INTERNET is allowed. Please see that the area in your threshold is clean. You will be charged for any material which can be classified as 'helping in the paper' found near you.
4. Talking/Discussion is not allowed. It is your responsibility to protect your code and save it from being copied. If you don't protect it all matching codes are considered copy/cheating cases.

Question 1. You are given a string with lowercase alphabets. Write a subroutine "reduceString" which deletes any *pair of adjacent alphabets* (with same value). For example, string "aabcc" would become either "aab" or "bcc" after calling subroutine reduceString. Write another subroutine "irreducibleString" which calls "reduceString" subroutine as many times as it can be performed and prints non-reducible form on screen. (20 marks)

Sample input : aaabccddd

Sample output : abd

- abccddd → abddd ; on calling reduceString first time
- aaabccddd → abccddd; on calling reduceString second time
abddd → abd; on calling reduceString third time

Question 2: Write a function DrawCross that takes one parameter via stack; the size of the cross. This function should print a Cross (X) sign on screen in the given size using X, / and \. The cross keeps moving from left to right on the screen in an infinite loop. If the cross reaches the extreme left or extreme right, it begins to move back. (20 marks)

For example:
If the size is given 3 then the size of the cross should look like :

```
    \       /

     \    /

       X

     /    \

   /        \
```

And If the size is given 5 then the size of the cross should look like :

```
\                 /

  \             /

    \         /

      \     /

         X

      /    \

     /        \

   /            \

 /                \
```