King Fahd University of Petroleum & Minerals
College of Computer Science and Engineering
Information and Computer Science Department
ICS 202 – Data Structures

Recursion

Objectives

The objective of this lab is to design, and implement recursive programs.

Outcomes

After completing this Lab, students are expected to:

- Design recursive solutions.
- Implement recursive methods.

Lab Exercises

1. Given an array of strings, write a recursive method that finds and prints the string of (a) minimum length and (b) another recursive method that finds the string of maximum length.

   Your methods should have signature as follows:

   (a) `public static String findSmallest(String[] array, int index)`

   (b) `public static String findLongest(String[] array, int index)`

   For example, if the array is {"apple", "mango", "banana", "nut", "watermelon"}

   then findSmallest method will return "nut", while findLongest will return "watermelon".

   Also write a main method to test your methods.

2. Write a recursive method putCommas(int x) that puts commas after every 3 digits in an integer "x" starting from the units place. The method is `public static String putCommas(int x)`

   For example, putCommas(1234567) returns 1,234,567.

3. Write a recursive method that deletes the k-th element from a DoublyLinkedList
   - Use the DLL.java and DLLNode.java classes from the previous labs
   - You can have 2 or 3 attributes in your method, but no loops are allowed inside its body.

   Sample Input: [1 , 2 , 3 , 4 , 5] and k = 2

   Sample output: [1 , 3 , 4 , 5]