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Department of Computer Science

COS212: Practical 2 (Tuesday)

Release: Monday 15 February 2016
Deadline: Tuesday 16 February 2016, 18:00

Instructions

Complete the tasks below. Certain classes have been provided for you in the *files* subfolder of the practical download. You have been given a main file which will test some code functionality, but it is by no means intended to provide extensive test coverage. You are encouraged to edit this file and test your code more thoroughly. Remember to test "corner" cases. Upload **only** the given source files with your changes in a zip archive before the deadline. Please comment your name **and** student number in at the top of each file.

Task 1: Recursion[5]

Below is the recursive definition of a function:

$$f(n) = \begin{cases} 0 & \text{if n <= 1} \\ n & \text{if n >10} \\ f(3 + f(n * 2 - 1)) & \text{otherwise} \end{cases}$$

Implement the `int recursion(int num)` function in `Recursion.java`. The parameter num is the number that needs to be solved using the functions definition. The function should return the result of the function.

Task 2: Word Jumble[15]

There are many ways to re-arrange the letters in a word. You will do this using an aspect of recursion known as backtracking (Look inside your textbook for more information).You will need to complete the solve(String word,int index) function found in `WordJumble.java`. This function takes in two parameters.

1. `Word`: The word that is getting jumbled.
2. `index` This is the position of the active character in the word. In the word 'Car' an index at position 0 would be 'C' and index at 2 would be 'r'.

There are some helper functions to help you:

- `addToList(String add)`: this function adds a string to a list.This list is the list of all possible word outcomes.
- `printList()`: this function prints the list of words for the word.
- `reset()`: this function resets the list of words.

There are a few things to note when doing this practical:

- There is an ArrayList provided for you.This will store the words using the addToList() function. You can not use any of Java's data structures in future practicals unless it is given to you or otherwise stated.
- You must use backtracking to complete this practical.

Submission

Submit your source files on the CS Website. Place all the files in a zip archive named as uXXXXXXXX.zip where XXXXXXXX is your student number. You have all week to finish this practical, regardless of what practical session you attend. Upload your archive to the *Prac2Tuesday* slot on the CS website. Submit your work before the deadline. No late submissions will be accepted.