Programming, and Data Structures

Workbook 8

This worksheet WILL be graded.

Today you will be learning how to write recursive programmes and comparing their running times with iterative programmes.

Before you begin.

1. Ensure that your workspace is in a folder which is backed up to the web/ network e.g. college network drive, google drive. You may like to have it in the following folder structure …/GriffithCollege/PDS/workspace
2. Load Eclipse selecting the appropriate workspace
3. Make a new java project called Workbook0x
4. Make a new package in this project called workbook0x
5. Make a 5 new java files with the name provided below.

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**\* COMMENT YOUR CODE!!!!!!! SERIOUSLY. I CANNOT GIVE MARKS IF YOU DON’T**

**\* EXPLAIN WHAT YOU ARE DOING.**

**\*/**

**NB** Use long instead of int when implementing.

1. **FactorialIterative.java** Revise the operation of the factorial calculation process. Discuss the pseudocode for the iterative solution with your classmate. Implement a java program in an iterative manner to calculate the factorial of a value entered by the user.
2. **FactorialRecursive.java** Discuss the pseudocode for the recursive solution with your classmate. Implement a java program in a recursive manner to calculate the factorial of a value entered by the user
3. **FibonacciIterative.java** Revise the operation of the Fibonacci calculation process. Discuss the pseudocode for the iterative solution with your classmate. Implement a java program in an iterative manner to calculate the Fibonacci of a value entered by the user.
4. **FibonacciRecursive.java** Discuss the pseudocode for the recursive solution with your classmate. Implement a java program in a recursive manner to calculate the Fibonacci of a value entered by the user.
5. **Timer.java** Write a program to test each of the 4 implementations above. Each function should be tested in a loop with input values from 1 to a suitably high number. Print the input to the function, the output from the function and the duration. *System.nanoTime()* will assist you in capturing a start time. Include a comment at the top of the class to say what you found and why you think this happened.

Submit your software via Moodle before the deadline. To submit, create an archive in the format

Lastname\_firstname\_studentNumber\_workBookNumber.zip eg Cronin\_Alex\_123456\_workbook0x.zip