Assignment 2 Recursion - 100 pts



Note: Never hard-code test data in the test program, unless explicitly stated otherwise in the assignment. Always allow the user to enter the test data using a menu option

GENERAL SUBMISSION REQUIREMENTS

Upload all files individually as specified, not as zip files, to Assignments in D2L. Do not email files.

Make sure your program compiles, runs, and produces the correct output.

Ensure you have the correct file name(s), and author header, as specified in the Assignment.

Always use meaningful labels for prompts, inputs, and outputs.

**Well documented programs use comments, indentation and whitespace as shown in text.**

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**Objective:** To reinforce the concept of recursion.

Assignment: There are two parts to this assignment.

**Part 1 - Factorial**

Write out the logic / pseudo code to compute the factorial of n, customarily denoted as n!

It is important to use correct recursion terminology in your pseudo code.

Next, use your pseudo code as the basis for writing a complete, well documented program. Your program should prompt the user to enter a nonnegative number and then display the factorial for that number. Your program must contain a function called *factorial*. Function *factorial* calculates the factorial of a number. Sample output is included below.

Enter a nonnegative integer: 4 <enter>

Factorial of 4 is 24

Do not forget to include author header in your file as shown, no header, no points!

|  |  |  |  |
| --- | --- | --- | --- |
| // Name: | <your name> |  |  |
| // Class: | CS 3305/ put your section number after the / | | |
| // Term: | Fall 2023 | | |

* Instructor: Carla McManus
* Assignment: 2 – Part 1 Factorial

**DELIVERABLE INSTRUCTIONS**

Capture a **READABLE** screenshot(s) of your program output and paste into a word/pdf document. Readable means readable! Screenshots ***should not be an entire desktop*** – use some type of snipping tool. After your output screenshots, copy and paste the source code for your program into the word/pdf doc. Make sure that the source you’ve copied and pasted into your word/pdf is the same as that in your .java source file that you will upload to D2L.

Save doc as a file named LastName-A2-Part-1-Factorial.docx or .pdf. word. Upload everything to D2L including the word/pdf doc ***and*** source code file.(.java file).

**Part 2 – Recursion**

Write a complete, well documented program, that prompts the user for input and tests a recursive function. You will write a function that implements recursion and produces the following output:

* Sample below is for input of 4:
* Note: indentions are required for credit.
* Expected Output

This was written by call number 1.

This was written by call number 2.

This was written by call number 3.

This was written by call number 4.

This was ALSO written by call number 4.

This was ALSO written by call number 3.

This was ALSO written by call number 2.

This was ALSO written by call number 1.

In this example, the recursion stopped when it reached four levels deep (because 4 was input), but your program should be capable of continuing to any specified level.

Do not forget to include author header in your file as shown, no header, no points!

|  |  |  |  |
| --- | --- | --- | --- |
| // Name: | <your name> |  |  |
| // Class: | CS 3305/ put your section number after the / | | |
| // Term: | Spring 2023 | | |

* Instructor: Carla McManus
* Assignment: 2 – Part 2 Recursion

**DELIVERABLE INSTRUCTION**

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Save doc as a file named LastName-A2-Part-2-Recursionl.docx or .pdf. word. Upload everything to D2L including the word/pdf doc ***and*** source code file.(.java file)

Submit everything to the assignment submission folder in D2L by the due date posted in D2L.

**No zip file or email submissions are accepted.** **Late penalties are in effect for this assignment.**

**Important Note:** Code must be correctly running and produce correct results before being uploaded.