CSCI 201 – Computer Science 1

Lab assignment 4: Nested `FOR` loops and Input/Output with Files
Due on Friday February 2.
Read sections 5.10, 5.11 and 5.12 of the text as you work on this assignment

Objective: *Become familiar with designing a solution using a* `for` *loop. Learn how to create a nested* `for` *loop in Raptor and in C++.*

This assignments deal with files and nested loops.
Input: The program prompts for the name of an input file and the name of an output file. The input file contains two positive (non-zero) integers, m and n, each less than 20, followed by a character.
Output: A file containing an $m \times n$ rectangle made using the specified character.

For example, if the input file contained the numbers 4 and 6 and the character $\star$ as shown below,

```
4 6*
```

the output file would show 4 lines of 6 stars each, as shown below:

```
******
******
******
******
```

This program will start by opening the input file and reading the numbers and the specified character. Thereafter a nested `for` loop will generate the pattern. The following questions are designed to step you through the process of creating the nested loop.

Question 1: Using Raptor, create a flowchart for the following process:
write a specified character (denoted `ch`*) n times on the output stream and move the cursor to the beginning of the next line.* (In Raptor, the character must be put in double quotes. When writing, uncheck the "end current line" box to stay on the same line; write an empty string with the box checked to go to the next line.)

Question 2: Created a nested loop in Raptor. The outer loop will run the inner loop a specified number of times. The result will be rectangular block of characters. Example for constructing a nested Raptor loop can be found here. Note that when you draw the nested loop in Raptor, the outer loop is created first, and the inner loop is placed inside it.

Question 3: Implement your algorithm in C++ using the `for` loops. Create three sample data files. In a script session, do the following:
1. `cat` the program file and compile it using `g++`.
2. For each data file you created, display the file, run the program and display the resulting output file.

What to submit. Create a folder named Lab4 in your CourseFiles folder and upload the Raptor flowcharts and your script to this.