Homework - C Loops - Shapes

This is a programming assignment that will be graded and scored as homework since it is so simple.

Write two functions in C as described below. These functions should be in a file named ***hwcl.cc.*** Make sure the file compiles and runs on the student machine before submitting.

Do not create any helper functions. You must ONLY have the two functions listed below.

You are ONLY allowed to include stdio.h. All other libraries will cause the test to fail.

YOU MUST USE PRINTF. DO NOT USE ANY C++ ESPECIALLY COUT or BOOL.

1. Create a function named ***printRectangleWhile***. The function should take a two integers as parameters (width and height in that order) and print a rectangle of pluses and dashes as shown below to the screen using only W***HILE*** loops. You are not allowed to use any ***FOR*** loops for this portion of the assignment. If a value less than 1 is passed as an argument, the function should not print anything.

   The rectangle should be printed with only dashes (minus), plus signs, and newlines. Each line should end with a newline. There should be no spaces or extra characters anywhere.

   For example:

   printRectangleWhile(10, 6);

   should print a rectangle with 10 columns and six rows as shown below.

   ```
   ++++++++++
   +--------+
   +--------+
   +--------+
   +--------+
   ++++++++++
   ```

2. Create a function named ***printTriangleFor***. The function should take an integers as a parameter for height and print a triangle of plusses and dashes as shown below to the screen using only ***FOR*** loops. You are not allowed to use any ***WHILE*** loops for this portion of the assignment. If a value less than 1 is passed as an argument, the function should not print anything.

   The triangle should be printed with only spaces, dashes (minus), plus signs, and newlines. Each line should end with a newline. There should be spaces before the first plus sign and no spaces after the last plus sign. There should be no extra characters anywhere else.

For example:

printTriangle(7);

should print a seven-level triangle as shown below (note the height and width are both 7)

```
      +
     ++
    +-+
   +--+
  +---+
 +----+
+++++++
```

Note that none of the rows should have spaces to the right. The bottom row should have no spaces to the left.

3. Compiling and testing
    a. Make a file named hwcl.cc with the functions listed above.

    b. **Make a NEW FILE named main.cc** with a main method which calls the above functions. You will need to put prototype functions into main.cc. A sample main.cc is given below.

       Use main for testing. Put negative numbers and zeros as arguments and make sure your program follows the instructions above exactly.

    c. Compile your program using the following command:

       ```
       g++  -Werror  -o hwcl   hwcl.cc   main.cc
       ```

    d. To run your program, use the following command

       ```
       ./hwcl
       ```

4. Submitting to Web-CAT
    a. **Make sure hwcl.cc DOES NOT CONTAIN A MAIN METHOD!**
    b. Compile and run on student first.
    c. You MUST remove all warnings.
    d. Submit **ONLY** hwcl.cc to Web-CAT. A link is provided on AsULearn.
    e. You can submit up to two days late. You will lose 10 points per day late.
    f. You will be penalized 1 point for every submission over 5. You should be testing your programs thoroughly before submitting.

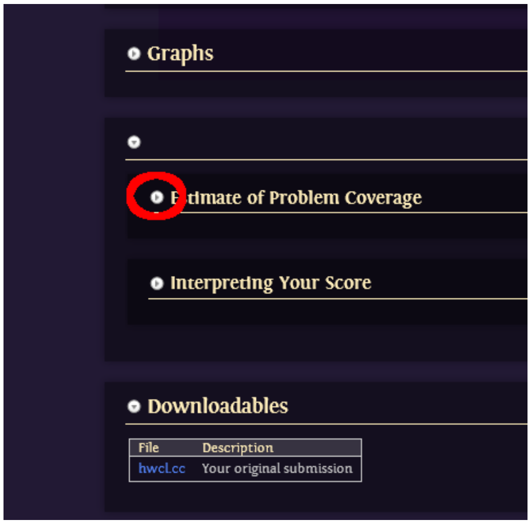
```
#include <stdio.h>

//Sample main.cc

//Prototypes from hwcl.cc are required so that
//the compiler knows parameters and return
//types for those functions at compile time.
void printRectangleWhile(int, int);
void printTriangleFor(int);


//USE OTHER VALUES OF WIDTH AND HEIGHT FOR TESTING.
//TEST YOUR FUNCTIONS THOROUGHLY.
//MAKE SURE YOUR FUNCTIONS WORK CORRECTLY
//FOR ODD VALUES (0, 1, -4, etc...)
int main()
{
      printRectangleWhile(10, 6);
      printTriangleFor(7);
}
```

Running the above should look exactly like this.

```
swansonja@cs: ./hwcl
++++++++++
+--------+
+--------+
+--------+
+--------+
++++++++++
      +
     ++
    +-+
   +--+
  +---+
 +----+
+++++++
swansonja@cs:
```

A NOTE ON WEBCAT and TEST FEEDBACK.

When Web-CAT has finished grading your submission, you will get to a screen that looks something like this:



Graphs

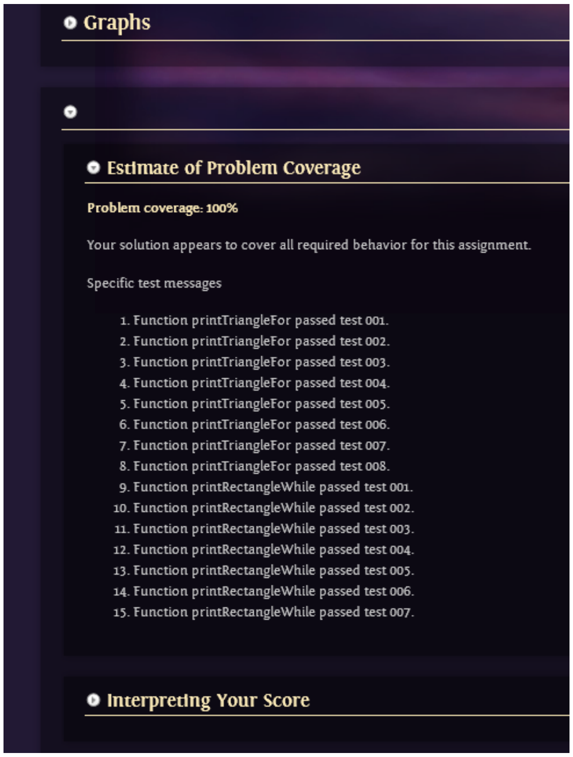
Estimate of Problem Coverage

Interpreting Your Score

Downloadables

File	Description
hwcl.cc	Your original submission

If you click on the triangle in the white circle (circled in red above) you will be shown the output message for each test, as shown to the right, which may help you troubleshoot your program.



Graphs

Estimate of Problem Coverage

Problem coverage: 100%

Your solution appears to cover all required behavior for this assignment.

Specific test messages

1. Function printTriangleFor passed test 001.
2. Function printTriangleFor passed test 002.
3. Function printTriangleFor passed test 003.
4. Function printTriangleFor passed test 004.
5. Function printTriangleFor passed test 005.
6. Function printTriangleFor passed test 006.
7. Function printTriangleFor passed test 007.
8. Function printTriangleFor passed test 008.
9. Function printRectangleWhile passed test 001.
10. Function printRectangleWhile passed test 002.
11. Function printRectangleWhile passed test 003.
12. Function printRectangleWhile passed test 004.
13. Function printRectangleWhile passed test 005.
14. Function printRectangleWhile passed test 006.
15. Function printRectangleWhile passed test 007.

Interpreting Your Score