

CS 135

Exercise #9

Point value: 40

Date due: email your source file (.cpp file) to your lab instructor by 11:59pm Mon, Mar 20

New Skills Practiced (Learning Goals)

- Problem solving and debugging.
- User-defined functions.

Use the cp command to copy the file ~lee/cs135labs/exercise09.cpp to your account.

Read through the file. It contains a C++ program designed to draw several pictures of triangles and rectangles. The main function will read in a series of data sets (from a file via Linux redirection) until the end of file is reached. Each data set will start with an R or a T, rectangle or triangle. If the data set starts with a T, it will be followed by 1 integer and 1 character. The integer represents the length of the height and base of a right triangle. The character is to be used when drawing the triangle. If the data set starts with an R, it will be followed by 2 integers and 1 character. The first integer is the vertical height (length) of the rectangle and the second integer is the horizontal width of the rectangle.

The draw_rectangle and draw_triangle functions are incomplete. The prototypes and headings have been supplied, but the statements for the bodies of the functions are needed.

For draw_rectangle,

- If the length and/or width are less than 2, the function should display an error message that includes the requested length and width and states that the rectangle will not be drawn.
- If the length and width are both greater than or equal to 2, then the function should display a label that includes the requested length and width and then draw the rectangle as a hollow shape using the specified character to form the outline (see examples below).

For draw_triangle,

- If the length of the base/height is less than 1, the function should display an error message that includes the requested base/height and states that the triangle will not be drawn.
- If the base/height value is 1 or more, then the function should display a label that includes the requested base/height and then draw the triangle oriented as shown in the program documentation and samples below.

REQUIREMENTS

- Add a comment to the start of the program with your name, lecture and lab section #s, and exercise #.
- Add a print statement to the main function that displays your name, lecture and lab section #s, and exercise # before the data file is processed.
- Add the statements to implement the draw_triangle and draw_rectangle functions as described in the program. These statements MUST be placed in the body of each function. Do not make any changes to the main function other than adding the print statement mentioned above.

When the program compiles and runs correctly, use the mail utility to email a copy of the program file to your lab instructor. Make sure the subject line of your email includes your name, lecture and lab section #s, and the exercise # if you wish to receive full credit.

NOTES:

- Make sure you choose enough test data to ensure that your program meets all the requirements.
- It is a good idea to send a carbon copy to yourself (-c option) of all emails sent to your lab or course instructor when using the mail utility.
- A comment with your name, lecture section#, lab section#, and exercise# should be at the start of your program file.

Sample terminal session:

```
[lee@bobby keys]$ more data4enine
T 5 +
R 3 8 @
T 3 $
R 2 1 &
[lee@bobby keys]$ g++ exercise09.cpp
[lee@bobby keys]$ ./a.out < data4enine
Lee Misch Lec#10__ Lab#10__ Exercise #9
```

Triangle with height and base of 5

```
+++++
++++
+++
++
+
```

3 by 8 Rectangle

```
@@@@@@@@
@      @
@@@@@@@@
```

Triangle with height and base of 3

```
$$$
$$
$
```

2 by 1 Rectangle will not be drawn

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