**BIL 105E – Introduction to Scientific and Engineering Computing (C)**

**Spring 2014-2015**

**Homework 1**

Assignment Date: 12.03.2015

Due Date: 19.03.2015

Duration: One week

You will write a C program (rectangle.c) that uses “\*” character to draw a rectangle of a given height, width and thickness. The program first asks the user to enter the height, width and thickness of the shape. If the user want to draw a rectangle, all three parameters should be given by the user.

The thickness of a shape indicates the number of stars(\*) between the inner space and the outer shell of a shape. You need to make a calculation beforehand to inform the user if it is feasible to draw a shape with the thickness value provided. If it is not possible to draw a rectangle with the specified thickness value, the user should be informed with a message “*It is not possible to draw your rectangle with the specified thickness. The rectangle without the thickness option is drawn below:*” and the rectangle should be drawn without any thickness (see the example below).

Notice that thickness cannot be achieved in all four sides of a rectangle. For example, when the rectangle is 7 (h) x 5 (w) with a thickness of 3, you can draw a rectangle whose upper and lower sides have a thickness of 3, but the left and right sides would have a thickness of 2 at maximum (see the example below).

After the first drawing, the program asks the user if he/she wants to continue drawing more rectangles. If the user wants to continue, **1** is given, otherwise **0** is given. When **0** is given by the user, the program terminates. When 1 is given by the user, the program asks the user to enter height, width and thickness of the rectangle again.

You can assume that the inputs are valid integers from 1 to 20 (inclusive). Based on the user inputs, you will draw the shape to the console.

**Below are sample outputs from the execution of the program:**

Enter the height for your rectangle: 10

Enter the width for your rectangle: 7

Enter the thickness: 2

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Do you want to continue? (1 for Yes, 0 for No): 1

Enter the height for your rectangle: 7

Enter the width for your rectangle: 5

Enter the thickness: 3

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Do you want to continue? (1 for Yes, 0 for No): 1

Enter the height for your rectangle: 5

Enter the width for your rectangle: 4

Enter the thickness: 2

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Do you want to continue? (1 for Yes, 0 for No): 1

Enter the height for your rectangle: 3

Enter the width for your rectangle: 3

Enter the thickness: 2

*It is not possible to draw your rectangle with the specified thickness. The rectangle without the thickness option is drawn below:*

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Do you want to continue? (1 for Yes, 0 for No): 0