IMPACT-CS Lab 3 / Filled House

Objective:
The purpose of this lab is to practice using nested while-loops and for-loops to draw filled rectangular and triangular shapes.

Assignment:
For this lab, you will be drawing the filled house shapes in a Raster image using nested while-loops and for-loops.

- This assignment should be completed individually.
- Your program should contain useful comments
  - The program should begin with comments identifying the lab title (lab1), author's name, TA name, and lab section.
  - Each section of your program should be commented sufficiently that it is easy for the TA to understand.
- Be careful that your variable names are appropriate and meaningful.
- The file should be in your lab directory and named lab2.py.

Include the usual identifying comments at the top of your file, as well as comments in your program explaining the purpose of the statements. Select meaningful variables names. Specific instructions are listed below:

Draw the rectangular house shapes (first without roofs):

1. Using a **nested while-loop**, draw a filled rectangular house shape of your color choice. Design the nested while-loop structure so that the shape is filled in by **rows** first. Add the necessary statement(s) as demonstrated in class to slow down the execution of your program statements so that the order of pixel color change may be easily observed. Experiment with different timing settings until you get one that you like. (Refer to the website python.org for more information.)

2. Add the code necessary to redraw the same house shape in the same location, also by row, but this time using a comparable **nested for-loop** instead of the while-loop. Use a different color to redraw the house.

3. Above, and to the right of the first house, draw a second filled rectangular house shape of your color choice, using a nested **for-loop**. Fill this second house shape in **column** order.

4. Add the code necessary to redraw the same second house shape in the same location, also by column, but this time using a comparable **nested while-loop** instead of the for-loop. Use a different color to redraw the house.

Add a triangular roof to one house:

5. Select one of your houses and add a peaked roof in a different color fill, using a nested a for-loop structure.
   a. First draw each right triangle half of the roof separately to form a complete roof.
   b. Next, using another color, redraw the same roof as a single unit. Will you draw it in row or column order? Write a brief statement explaining your approach, and list the steps of your algorithm. (These may be included as comments at the end of your program.)
For extra credit:
Write your code as required in the instructions above. Then, complete the following steps:

1. Add statements to the nested for-loop for your second house shape in order to draw a striped pattern of columns in at least two colors, with each column at least 5 pixels wide.
2. Modify the nested while-loop for the second house in order to accomplish the same effect, choosing different colors.