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CPADS Lab Activity I

Due: Monday, 10-5-2015

For this lab activity, you have been provided with a Python project, **Lab_Activity_1.zip**, which you must first download from the CS100 website. From your download folder, extract the ZIP file into the same location where you have been storing your other work for CS100. You can then open the extracted folder as a Python project by browsing to it in under **File->Open->Open File or Project**.

Run the **pyramid.py** file that is located in the project. If you are asked to select a Python interpreter, choose **Python 3.4.1** from the dropdown box in the dialog window.

This exercise is intended to give your more experience in working with functions, and with establishing the connection between function parameters, and the arguments used in the function calls to pass values to those functions.

The **pyramid.py** file provides the **square(t, x)** function that draws a square of size **x** CCW for the specified “turtle” **t**. You will NOT need to alter this function.

Three versions of the **row** function have been provided– each of which has a different parameter list.

- 1) **row_fixed_size_fixed_num(t)** draws a row containing a fixed number of blocks (4), using fixed sized blocks (20).
- 2) **row_fixed_size_var_num(t, numBlocks)** draws a row with a variable number of blocks (as specified by **numBlocks**) of fixed size (20).
- 3) **row(t, numBlocks, blockSize)** draws a row with a variable number of blocks (as specified by **numBlocks**) with the block size specified by **blockSize**.

Your first task is to modify row functions 2) and 3) so that they perform the specified tasks. As provided, the code is “broken” in that each of those functions only draws a row of fixed length (4 blocks) of size 20 (just like row function 1). Make sure to address each “TODO” in the functions.

The **main()** function provided will test those row functions for you – it asks for user input for each row function and then calls that function, passing the user input to the function, which then draws the output, waiting for you to press <enter> before calling the next row function. The program clears the screen in between each function call.

- a) Modify the **row_fixed_size_var_num(t, numBlocks)** function so that it produces the desired output, as specified in the description and run the program several time with a variety of input so that you can verify that your modifications meet the specification for that function.
- b) Modify the **row(t, numBlocks, blockSize)** function so that it produces the specified output, and then run the program again, several more times with a variety of input so that you can verify that it produces the specified output.

After you have the row functions working properly, you can move on to the provided pyramid functions.

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Two versions of the **pyramid** function have been provided – each of which draws a different type of pyramid. Both functions call the **row(t,numBlocks, blockSize)** function. You will need to modify both pyramid functions in order to have them draw a pyramid as specified below. Make sure to address each “TODO” in the functions.

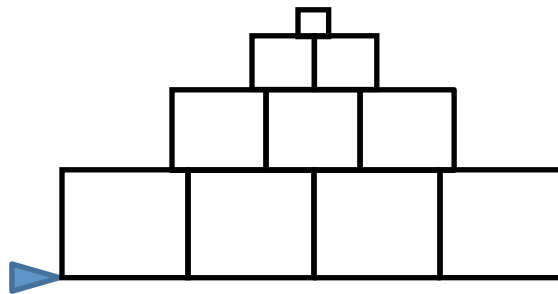
- 4) **pyramid_fixed_block_size(t, height)** should draw a pyramid of the specified height, with a fixed block size (20).
- 5) **pyramid(t, height)** should draw a pyramid of the specified height, with blocks of a size that is relative to the number of blocks in each row. For example, a pyramid of height 4, should have four blocks in its base, of size $4 * 20$, and 3 blocks in its next layer of size $3 * 20$.

Note: The value 20 is considered the size multiplier, and is used so that the blocks are drawn to an appropriate scale for the drawing surface. You will need to use this multiplier in various places for block size, and movement between blocks and rows.

The **main()** function provided will test those pyramid functions for you – it asks for user input for each pyramid function and then calls that function, passing the user input to the function, which then draws the output, waiting for you to press <enter> before calling the next pyramid function. The program clears the screen in between each function call.

- c) Modify **pyramid_fixed_block_size(t, height)** so that it produces the output as specified in 4) above.
- d) Modify **pyramid(t, height)** so that it produces the output as specifies in 5) above.

For example, a call to **pyramid(t,4)** would result in the following pyramid being drawn:



Please feel free to ask for assistance while working on this lab. After you have completed all of the above tasks, demonstrate your completed program to your instructor. If you do not finish the lab in class, you may continue work on it outside of class – just make sure that you demonstrate your completed program for you professor during the next class.