CS 111 – Program Design I, Fall 2016

Lab 9

Due: Wednesday 11/2/2016 by 11:59 pm

For this lab assignment, you are to take an image and create a new image that will show multiple instances of the images stacked one on top of another.

The program in lect1027c.py may be useful in completing this project. This code repeats part of a picture horizontally three times.

For this lab, you must have a python function named "lab9( )" that completes the following:

1. Prompt the user for a number that will determine the number of times the image gets duplicated.

   To get the user's input, we will use the requestIntegerInRange() function from the JES library. This function will display a "pop-up" window that will prompt the user to enter an integer value. If the user does not enter a value in the range from min to max, the prompt will re-ask the user for another value. The function takes a String parameter will be displayed as a message when the user is prompted for the input. It also takes two more parameter which specify the range the number entered by the user must be in. The following code shows this.

   ```
   # prompt the user for the number
   value = requestIntegerInRange  ("Please enter an integer value between 1 and
   10.", 1, 10)

   # display the value entered by the user
   print "The user entered: " + str(value)
   ```

   For this lab, what should the range of values be? The lower number in the range should be one. Values less than one don't really make any sense. (Perhaps the value of zero could make sense, if you wanted to run the program that didn't create any duplicates of the image. But then why run the program at all?) The upper number in the range could be somewhere around 10, because creating more than 10 duplicates would make the final image quite large.

2. Prompt the user for the image file to use.

3. Call the function to duplicate the image the number of times indicated by the integer value given by the user. This duplication must to occur in its own function.   The function is to take two parameters
   1. the original picture
   2. the number of duplicates to make.

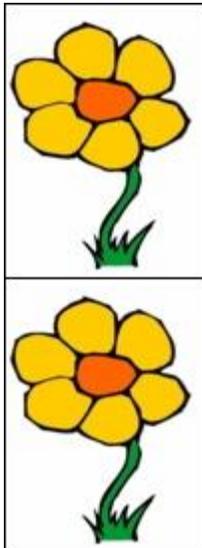   The function must **return** the new picture.

If we passed in as parameters the flower image and the value of 1, the function would return:
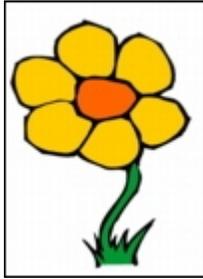
Passing in the flower image and the value of 3, the function would return:
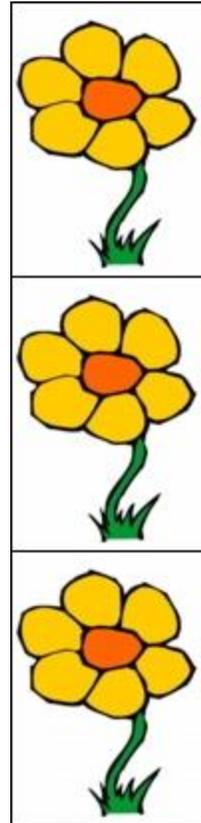
Passing in the flower image and the value of 2, the function would return:

Since we are stacking the duplicate images one on top of the next, the width of the new image will be the same as the original image. The height of the new image will be the result of multiplying the height of the original image by the number of duplications we want to create. Thus if the original image had height of 250, the resulting image with 1 duplication would have height of 250 (250 x 1). The resulting image with 2 duplications would have height of 500 (250 x 2). The resulting image with 3 duplications would have height of 750 (250 x 3). The resulting image with 4 duplications would have height of 1000 (250 x 4).

As we copy the images onto the resulting canvas, we must make sure the Y coordinate of the resulting image would equal to the Y coordinate of the original pixel plus the height of the image multiplied by a value specifying which copy is being created. Thus for

- The first copy is "shifted down" by a height of 0.
- The second copy is "shifted down" by a height of 1.
- The third copy is "shift down" by a height of 2.
- Etc.

Your code must add one more NESTED loop to the code used during lectures:

- If the program is to copy the picture one time, this NESTED loop runs once.
- If the program is to copy the picture two times, this NESTED loop runs twice.
- If the program is to copy the picture three times, this NESTED loop runs three time, etc.

4. Display the picture returned by the duplicate function.

5. Prompt the user for another filename in which the resulting is to be stored and store (write out) the resulting picture to this file.

Be sure to include a comment at the top of your program containing the following information:

1. your name
2. your NET-ID
3. day and time of your CS 111 lab section (i.e. Monday at 3:00)
4. A description of the project.

Be sure to include a comment at the top of EVERY function containing the following information:

1. The name of the function
2. The purpose of any parameters used/used by the function
3. The purpose of the return value of the function (or a statement saying there is no return value)
4. A high level description of the purpose of the function (which might be very similar to the description for the project).

How assignments should be submitted

You are to submit your program electronically using the link for Lab 9 on the Assignments Page in Blackboard. Your python program should be in a file named using both your Net-Id and lab9, such as:

ptroy4lab9.py