CS 120 – Spring 2023 – Project 1

"ART SHOW!"

OVERVIEW

Write a Jython program as described below which creates a photo collage of modified images. The entire collage must be created using only Jython – no Photoshop, etc. allowed. (The only allowable use of Photoshop, etc. is to reduce the *original* resolution of a high-resolution image to start with.) You should have a single function make all of this happen–all of the effects and compositing must occur from a single function named ***collage()***. IT IS COMPLETELY ACCEPTABLE AND EXPECTED FOR ***collage()*** TO USE OTHER FUNCTIONS! I will *setMediaPath()* to your project folder, execute ***collage(),*** and expect to see your collage get generated. This project will exhibit your ability to utilize looping, conditional statements, and image manipulation techniques presented thus far in the semester. You should reference your past activities and labs for ideas.

This project will demonstrate your ability to meet the following course student learning objectives:

1. Explain how **digital media can be treated as data** and the implications to society.
2. Identify, compare, evaluate, and write programs that use the **sequencing**, **iteration**, and **selection** constructs in a high-level programming language.
3. **Calculate the value of expressions** and explain the **effect of statements** in a high-level programming language.
4. Identify, compare, evaluate, and use the formal elements of **procedural abstraction**, including parameters, local variables, and return values.
5. Write programs that use a **one-dimensional data structure to represent aggregate data** and **iteration to compute over the structure**.

ALGORITHM

Use this extremely high-level algorithm to develop your solution. You will need to add more details to the algorithm to complete your project.

1. Start with a blank canvas that is a maximum of 1000 pixels wide by 736 pixels tall, or a maximum of 736 pixels wide by 1000 pixels tall.
2. Scale, crop, and modify your images, and then copy them to your blank canvas.
3. Display the resulting collage image on screen.

EVALUATION

D: You will receive a grade of D or better for the project if your submission includes or does all of the following.

If any of the specifications listed for a D are not met, you will receive a grade of F.

1. ALL of your files for the project are placed into a single folder named project2. Don't forget the reflection paper, etc. Compress (zip) this folder, creating project2.zip. Submit this compressed folder.
2. A project reflection paper is submitted. See Canvas for a description of its content.
3. All needed files are submitted, including the required image files.
4. The final collage that your program creates must be appropriate for all ages to view.

5. All beginning images used in your collage must satisfy at least one of the following:
   a. You own the image, or you have documented permission from the copyright holder to use it.
   b. The image is included in the "JPG Images.zip" file provided in the CS 120 area of Canvas.
   c. The image is available royalty-free in the public domain.
6. Submitted program:
   a. Will load in JES.
   b. Will run in JES.
   c. Produces a collage which includes the same image (or a modification of it) at least two times.
   d. Displays the completed collage image.

C: You will receive a grade of C or better for the project if your submission includes or does all of the following.

7. All items listed above for a grade of D.
8. Submitted program:
   a. Has a main function named *collage*.
   b. Does not prompt for any input, but rather has all files specified in your code, and makes use of the *getMediaPath()* function.
   c. Produces a collage which includes the same image at least five times, with one or more modifications applied to four of them.
   d. Includes reasonable documentation comments, as appropriate. At a minimum, include comments at the start of the code that includes your name and the date. Additional comments can be included in your code similar to those used by the author in the text book.
   e. Is formatted/indented, similar to the text book authors' examples.

B: You will receive a grade of B or better for the project if your submission includes or does all of the following.

9. All items listed above for a grade of C.
10. Submitted program:
    a. Produces a completed collage which
       i. Is a maximum of 1000 pixels wide by 736 pixels tall, or a maximum of 736 pixels wide by 1000 pixels tall.
       ii. Includes the same image at least five times: once in its original form, and at least four more times modified in any way you want, using at least four different modifications. Additionally, you may place any number (including none) of different images on the blank starting canvas, provided you meet the minimum requirement of five of the same image. Possible image modifications include, but are not limited to the following. Each of the utilized modifications must alter the original image's appearance in some noticeable way.
          - Grayscale
          - Negative
          - Blend
          - Shift colors
          - Crop
          - Scale
          - Rotate
          - Mirror
          - Posterize
          - Lighten/darken
          - Sepia tone/cyanotype
          - Line drawing/edge detection
    b. Uses descriptive function and variable names.
    c. Is appropriately hierarchically decomposed.

A: You will receive a grade of A for the project if your submission includes or does all of the following.

11. All items listed above for a grade of B.
12. Submitted program:
    a. Includes at least one modification algorithm for the original image which is created or significantly modified by you, and not directly copied from another resource.
    b. Includes a chromakey-*like* function to "sign" your collage by using an image file containing your signature on a white background. Change corresponding pixels in your collage to a contrasting color when it detects the non-white pixels of your signature. Your signature image should be smaller than your collage.

NOTICE:

Completed projects may be posted online by the instructor (with attribution to you, unless you wish to remain anonymous) so that others can view your creations. **Additionally, your completed project will be entered into a BSU CS 120 Art Show.** Details about the art show will be provided separately.

TO SUBMIT YOUR WORK FOR GRADING:

1. Place ALL of your files for the project into a single folder named **project1**. Don't forget the project reflection paper, and needed starting images, etc. Compress (zip) this folder, creating **project1.zip**.
2. Log into Canvas and enter the CS 120 part of the site. Go to the **Projects** area by using the "Projects" navigation link in the grid. Inside the Projects area, click on the "**Project 1**" link.
3. Find the "Submit Assignment" button, and then click on it. Click on the "Browse…" button and locate and select your **project1.zip** compressed (zipped) file you created in step 1 above.
4. Once you have attached your compressed file, click on the "Submit Assignment" button at the bottom of the submission page.