CSCI 501 / 701 - SP&P

Fall 2021 - Homework 1

Photo Collage Application

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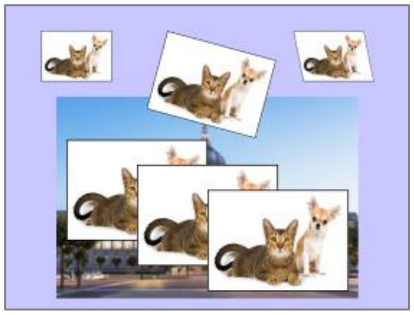

Due date : Sunday, October 10th, 2021 (Submission through Moodle by 23:55 Astana Time)

In this homework assignment, you will be finishing the implementation of a ***Photo Collage Application*** that reads collaging commands from a text input file in ***Temizer Photo Collage*** (***TPC***) format, and outputs the collage image in ***Plain PPM*** (portable pixel map) format. You are provided with professional code which implements most of the application for you. To finish the application, you just need to implement the following functions marked with the comment **TODO** in the following files:

- **AffineTransformation.c** : *xInverse*, *xMultiplyMV*, *xMultiplyMM*
- **PPM.c** : *SavePPM*
- **Main.c** : *primitiveCopy* (and/or *advancedCopy* for possible bonus)

The Windows (32-bit) and Linux (64-bit) executables of my sample implementation are also provided for you to try out various inputs and see the correct outputs. Note that for this homework assignment, you may assume that the input will not have any syntactic or semantic errors in it.

Bonus – Advanced Copy (2 points)

One way to copy the input image onto the output canvas is to iterate over input image pixels, map (calculate) their position on the output canvas (truncating fractional coordinates), and copy them there. However, due to truncating, the output quality will not be satisfactory for a professional application (we can call this approach as *primitiveCopy*).

A more professional way is to iterate over the canvas pixels, see if they (inversely) map within the boundaries of the input image, and for those pixels that map inside, calculate an interpolated color by accounting for the fractional coordinates and using the neighboring pixels (which is what we call *advancedCopy*). This mechanism is more involved and slightly trickier to implement, but it gives professional results. If you correctly and fully implement the advanced copying, you will get 2 (out of 10) bonus points.

What to submit?

Just implement the missing functions and submit only the ***3 completed C files***. Do NOT rename them, and there is NO need to zip them before submitting (for this homework exercise).

Note that late submissions or email submissions will **NOT** be accepted. Good luck!
