

CIS 441/541: Project #1B  
Due 1159pm April 7<sup>th</sup>, 2021 (meaning 6am April 8<sup>th</sup>)  
Worth 3% of your grade

### Instructions

- 1) Download and build project1B.cxx. Re-use your CMakeLists.txt from project1A, and just replace "1A" with "1B"
- 2) Project1B.cxx contains a routine that will generate 100 triangles.
  - a. All of these triangles have two points with the same X value and the third point with a greater X value (i.e., "going right" triangles)
- 3) Implement the scanline algorithm to these triangles and fill up the image buffer with their colors.
- 4) The correct image (100triangles.png) is posted to the website.

When you are done, upload your code to Canvas.

If your code does not produce exactly the same image, you should expect to get less than half credit. You can confirm that it produces the same image with the difference program and the reference image on the website (100triangles.png).

**IMPORTANT:** you should use "double" to get double precision (8 byte) floating type. The word "float" should not appear in your code. If you use float, then you will get mostly the right picture, but you will have ~30 pixels wrong.

### Some notes:

- 1) I began my implementation by figuring out which vertex was which, i.e., which was top-left, which was bottom-left, and which was right
- 2) Some pixels may be outside the screen. Plan for that.
- 3) Don't forget to use double precision and the floor\_\_441 and ceil\_\_441 functions.
- 4) Be careful about which quantities you want to be integers and which you want to be double precision.
- 5) What I printed when debugging:
  - a. The triangle (I added a print method)
  - b. Which vertices were which (top-left, bottom-left, right)
  - c. The range of scanlines for a triangle
- 6) **FINALLY:** start by working on just a single triangle and get that working entirely. Then try all of the triangles at once. Below are my print statements for triangle 55.

Columns go from 500 to 560

For column 500, rows go from 500 to 599

For column 501, rows go from 502 to 598

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