ECS 175 Project 1

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How To Compile and Run Program

1) On the command line, run "make".
2) My Makefile should create an executable called "main"
3) Run "main" to start program
4) Run "make clean" to clean-up object files

How to Run Program

1) You can start my program one of two ways:
    1. Run "main *inputFile*"
    2. Run "main"
2) If you provided an input file, then it will grab matrix data from that input file, otherwise it will ask you for an input file.
    1. The executable expects only 1 input file, if you put in multiple input files then it will warn you that there were too many entries and exit
3) After an input file has been specified, the program will ask you to specify the Window Size (for both X and Y)
4) After providing the Window Size, the program will ask you which line drawing algorithm to use, either:
    1. for DDA
    2. for Bresenham
5) After your selection, the program will show a menu to choose which operation to do:
    1. for Rasterization
    2. for Clipping
    3. for Transformations
    4. for Displaying right away
    5. for Writing to a file
    6. to exit

6) If you choose Rasterization, it will ask you which polygon id that you would like to fill from the range of id's available. After you made your selection it will show you the polygon you chosen filled.

7) If you choose clipping, the program will ask you the following for the viewport:
   1. Xmin
   2. Xmax
   3. Ymin
   4. Ymax

8) After making your selection, it will display the proper clipping for each polygon.

9) If you choose Transformation, you will have a choice of the following:
   1. Translation
   2. Scale
   3. Rotation
   4. Cancel/Display

10) Once you have made your decision, unless if you choose to cancel which brings you back to the start, it will ask you which polygon id you would like to Transform from the range of possible Polygons

11) If you choose Write to a file, the program will ask you file you would like to write to, then proceeds to write to the file the polygons we have, which may have changed, depending on whether or not you had done a transformation. The output will be similar to how the input files are and could be used for future input.

12) The only option left is exit, which closes the program.

Where did I implement my Algorithms and notes about them:

Note: If no note included, then I suspect that the algorithm is working as intended.

Bresenham: Bresenham.cpp from lines 13 to 128

DDA: DDA.cpp from lines 14 to 43;

Translation: main.cpp from lines 214 to 219

Scaling: main.cpp lines 221 to 238

Rotation: main.cpp lines 240 to 262

Writeback: main.cpp lines 265 to 270

Rasterization: main.cpp lines 273 to 378

Note: Doesn't seem to work for every polygon, will act wonky at times, and I don't understand why. I am unsure if I am handling certain horizontal lines incorrectly, or if it has to deal with my extrema. Works for the polygons I have in my input file at first, but if I were to change polygon 3 to rotate 50 degrees, there's lines that will trail off after that.

Cohen-Sutherland: main.cpp lines 33 to 135

Sutherland-Hodgman: main.cpp : lines 380 to 473

Note: It doesn't seem to work correctly. I have been working on it for a long whole now, and there doesn't seem to be a clear reason on why the clipping doesn't work. Perhaps it has to deal with when I am calculating my edges or out of bound cases.

Other than that, I don't believe my program crashes for intended use, and the algorithms work to the best of my ability!

Extra Credit:

- I havent had the time to Rasterize any concave or complex polygons, but I do hope that this Readme file is intuitive enough, and my UI is pretty enough to warrant some extra credit! Other than that, I hope I did well!