CS 3210, Lab #3, Line and Circle Drawing

1 PURPOSE

The purpose of this lab is to explore drawing in the X Window system and to implement scan conversion algorithms.

2 ASSIGNMENT

Download the "lab3starter.zip" file in the shared Box folder. Unzip and verify that you can compile the project. The project should run with the included scan conversion implementations.

Your job is to implement Bresenham's line drawing algorithm and Midpoint circle drawing algorithm.

- Replace GraphicsContext::drawLine with your Besenham's implementation. Take care to handle various combination of slopes and endpoints in your algorithm implementation. Avoid all floating-point math per the goal of the algorithm.
- Replace GraphicsContext::drawCircle with your Midpoint circle implementation.
- Fully test your implementations by rewriting / enhancing main(). Be sure to test various slopes and combinations of enpoints. Also draw something "interesting."
- Your implementations should be tolerant of negative coordinates even though they will not draw on the screen (setPixel is tolerant).
- Do not change any of the supplied public interfaces.
- **OPTIONAL** – draw a better line, like this: https://en.wikipedia.org/wiki/Xiaolin_Wu's_line_algorithm

This assignment is due to be submitted prior to lab in Week 4.

3 SUBMISSION

Prior to lab in Week 4, submit source files(including header files) and your makefile in a single zip file on Blackboard. You do not need to print out the code. You will be asked to demonstrate your program to the instructor during lab.

4 GRADING CHECKLIST

- Submission received on time (grade multiplier 0.80 if not)
- Check items that will apply to all assignments (50 pts, 10 pts each)
    - Submission complies with guidelines (color pdf, no wrapped lines, line numbers, proper ordering, zip file with buildable code)
    - Source code presents as professionally written (comments, indentation, variable naming, structured)
    - Compiles with no errors or warnings (using -Wall)
    - Runs to completion with no crashes or memory leaks (using valgrind)
    - Makes exclusive use of C++ standard library features - no libc unless necessary
- Check items that are particular to this assignment (50 pts, divided equally unless otherwise noted)
    - No changes are made to public interface of any provided class
    - Algorithms perform with all combinations of supplied parameters (line slopes, etc)
    - Drawing algorithms are reasonably tested by driver code in main and/or functions called from main
    - Draws something "interesting."