Lab-01: Draw 2D objects with OpenGL

CSC411: Computer Graphics
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Objective

In this lab, the students will implement the algorithms to draw 2D Objects using OpenGL Library.

Requirements

- Draw 2D objects include: line, circle, ellipse, parabola, hyperbola using taught algorithm (DDA, Bresenham, Mid-Point) using Open GL & GLUT
- Benchmark & compare your result (in time & accuracy) with existed functions in OpenGL.
- Write programs in OOP methodology.

Input:

- Text file that have *N* lines
- Each line represents 1 object, that have *M* values separated by space. First value indicates object type, while the others indicate object parameters (all distances are pixel length)

- *Line draw by DDA algorithm:*

0	X1	Y1	X2	Y2

(X1, Y1): begin point
(X2, Y2): end point

- *Line draw by Bresenham algorithm:*

1	X1	Y1	X2	Y2

(X1, Y1): begin point
(X2, Y2): end point

- *Circle draw by MidPoint algorithm:*

2	XT	YT	R

(XT, YT): center point
R: radius

- *Ellipse draw by MidPoint algorithm:*

3	XT	YT	A	B

(XT, YT): center point
A: ½ major length
B: ½ minor length

- *Parabola draw by MidPoint algorithm:*

4	XT	YT	P

(XT, YT): center point
P: focal length

- *Hyperbola draw by MidPoint algorithm:*

5	XT	YT	A	B

(XT, YT): center point
A: major length
B: minor length

Output:

- Program that build as **Release** configuration attached with glut.dll
- **GLUT/ screen**: draw object
- **Console**: execution time in millisecond (ms)
- Report (Latex):
  - Comparison of **execute time** of each object between self-implementation algorithm and Open GL function
  - Comment about the accuracy of implemented algorithm.

Submission

Create 3 folder, compressed in 1 file MSSV_Lab1.zip

- Document
- Release
- Source

Resources

- Graham Sellers, OpenGL SupperBidle, Cheapter 1, 2, and 3.