

Indian Institute of Technology Jodhpur

CSI7450: Computer Graphics

Programming Assignment 1

Due Date: January 16, 2021, Max Marks: 10

Instructions:

- Make a group of two students.
 - Clearly mention the contribution of each group member in the readme file.
 - Prepare a readme file mentioning how to run your code.
 - Zip all your codes and files in a single file and name it with the roll number of both the students. Fragmented files will not be considered for evaluation.
 - Copying from the Internet and your classmates is strictly prohibited. If found, you will be awarded **-10** marks for the assignment.
1. Implement the Midpoint Line Algorithm (using only integer operations) to draw a line from the point (x_0, y_0) to (x_1, y_1) , Here x_0, x_1 can be anywhere in the range $(10, 400)$ and y_0, y_1 can be anywhere in the range $(10, 400)$. Display your output on a viewport of size 500 with left bottom corner at $(10, 30)$.
[3 Marks]
 2. Implement the bounding box based algorithm to draw a triangle with vertices (x_0, y_0) , (x_1, y_1) , (x_2, y_2) . Here, x_i, y_i can be anywhere in the range $(10, 400)$. Extend the incremental line drawing (integer operations) to draw a triangle. To reduce the stair-casing effect, implement the supersampling technique. First draw a triangle at the resolution of $4\times$ the resolution of the original window and then apply supersampling.
[5 Marks]
 3. Implement the Midpoint Circle algorithm (using only integer operations) to draw an arc of radius 100 pixels centered at the origin and starting from 135° to 215° . The use of 8-way symmetry is strictly prohibited. Traverse along the arc in the counter-clockwise direction. Use the appropriate size of the window and viewport.
[2 Marks]