

Computer Graphics Assignment set 2

1. Given the window $W1(0,0)$, $W2(10,0)$, $W3(10,10)$, $W4(0,10)$ and the polygon $A1(-5,-5)$, $A2(5,-5)$, $A3(5,5)$, $A4(15,5)$, $A5(15,Y)$. Choose $Y > 10$. Clip the polygon against the window. Use the orientation function $s_i = \text{Or}(A_i, P, Q)$ from handouts or slides, where P, Q is the window's edge. Use the table to decide what to store in the vertex list. Evaluation: all S_i calculated (20), all in/out checks and answers (20), all new intersection points calculated (20), all vertex list updates (20), all steps correct with final correct final vertex list (10), image drawn (10).
2. Given the clipped polygon (result) and the window from Example 1. Run the scan line conversion algorithm on the polygon from scan line #0 till scan line #6. Hint: If you do not solve Example 1 just guess the vertices of clipped polygon as precise as you can. Evaluation: edge preprocessing (10), edge table filled with correct data for all needed edges (30), active edge table filled with correct data for all needed edges (20), active edge table update for all scan lines (30), filling the scan lines (10).
3. Given the clipped polygon (result) and the window from Example 1. Calculate rasterization of clipped edge ($A5, A1$) using the Bresenham (Midpoint) algorithm. Evaluation: finding the start and end pixels (10), finding the octants and conversion to first octant by choosing the proper x and y increments or decrements (20), all midpoint calculation (20), all midpoint tests (20), all increments x and y (20), draw an image (10).