

CPSC 314 Homework 4



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NOTE: These homework problems are not graded. **However**, I strongly encourage you to take them seriously as a preparation for the second quiz and the final exam.

This problem sheet deals with scan conversion. Solutions will be discussed in the labs in the week of February 23-27.

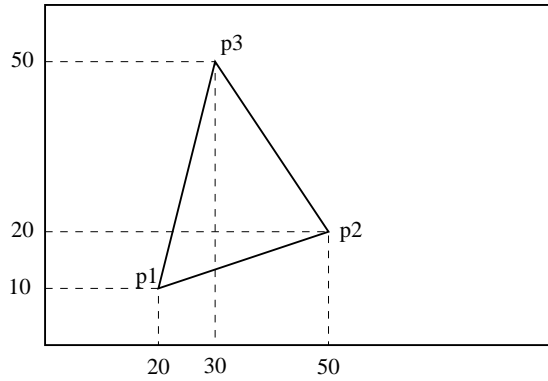
1 Scan Conversion of Lines

a) Give pseudo-code for the DDA (Digital Differential Analyzer) algorithm for scan-converting lines. Assume the start point is to the left of the endpoint, and the slope is in the range $0 \dots 1$.

b) What are the key differences between the DDA and the Bresenham algorithm? What are the respective advantages and disadvantages?

2 Scan Conversion of Triangles

a) Derive the **edge equations** for scan-converting the triangle given in device/pixel coordinates below. Pay attention to the sign of the equations, so that positive values correspond to the inside of the triangle.



b) Derive the **plane equation** for interpolating some property c across the triangle. The values at the vertices are $c_1 = 0$, $c_2 = 1$, and $c_3 = 2$, respectively. You don't need to solve any equation systems that may arise.