

Ksu.Cis300.MapViewer

User Requirements

The user requires a program to view map data at various zoom levels. Because this is a prototype, the functionality will be somewhat limited.

The maps to be viewed are rather small - no more than 100 miles in either direction. They are represented in a file format described below. These files contain only descriptions of streets accessible to cars.

It must be possible to zoom the map to seven different levels of detail. Each successive zoom level should give twice the resolution and greater detail. The zoom levels should range from a minimum (0) that can display several towns at once, to a maximum (6) capable of detailing the lanes in a parking lot. It should also be possible to pan the map when the zoom level is high enough that the entire map won't fit in its window.

Map Coordinate System

The streets will be described using a coordinate system with the point (0, 0) at the northwest corner. Points on the map will be expressed as (x, y), where x is the distance in miles from the west edge of the map, and y is the distance in miles from the north edge of the map.

Note that in order to convert these points to pixel coordinates, we only need to know the scale factor we are using - i.e., how many pixels we are using to represent one mile. We can then multiply both the x and y coordinates by this scale factor to get the pixel coordinates.

File Format

The map data files will be in plain text format. The first line of the file should contain two nonnegative floating-point numbers, separated by a comma. The first of these numbers gives the map width, and second gives the map height. Both values are in miles.

Each successive line of the file will describe a straight-line segment of a single street. The description will consist of seven numbers separated by commas. These seven numbers are as follows:

The (floating-point) x-coordinate of one end of the line segment.

The (floating-point) y-coordinate of this end of the line segment.

The (floating-point) x-coordinate of the other end of the line segment.

The (floating-point) y-coordinate of this end of the line segment.

An integer giving the color of the line segment in ARGB format.

A floating-point number giving the line width in pixels.

An integer giving the number of zoom levels at which this segment should be shown.

Note that such files may be viewed in a spreadsheet - each value will be shown in a separate column.