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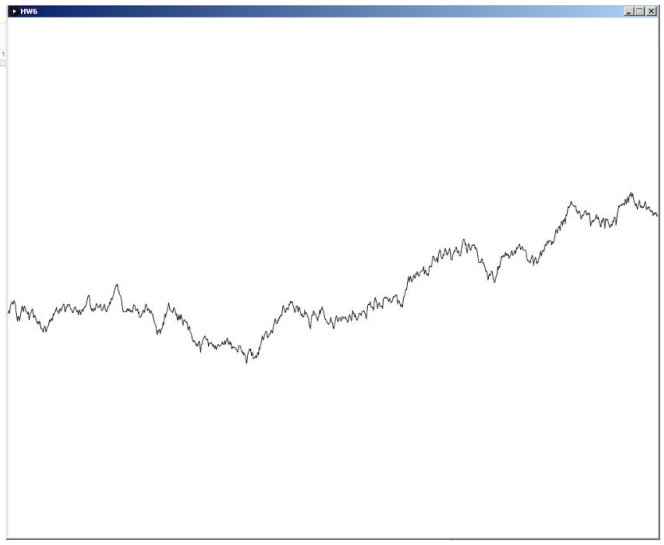
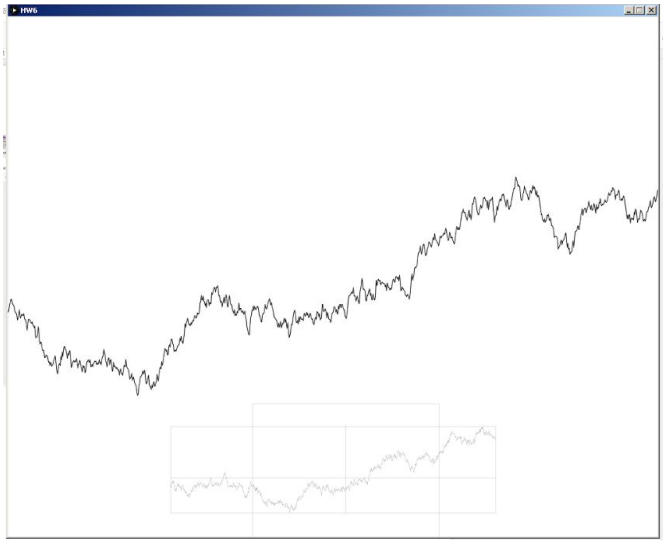
Homework 6

(A) Data Overview:

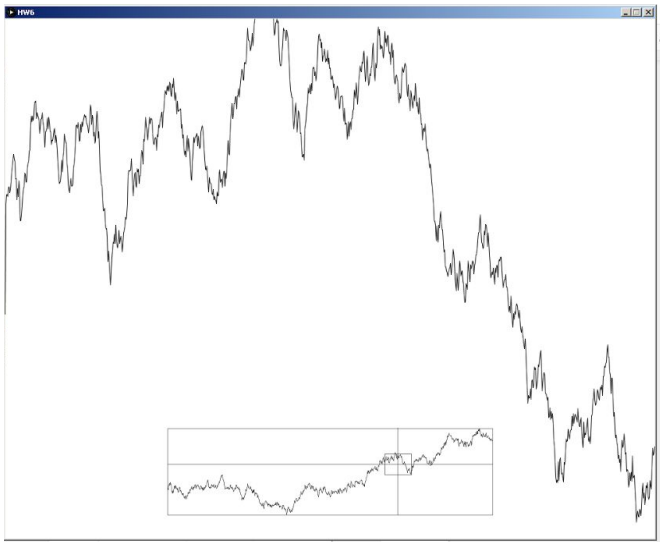
My solution provides a data overview by first presenting the dataset in-full to the user, then, upon zooming, a miniaturized view of the entire dataset fades in towards the bottom of the screen. The “mini-map” that fades in shows the current viewing area as well as a crosshair centered over the camera position such that when the viewing area is too small to see on the “mini-map”, the crosshair still visibly indicates the camera position.



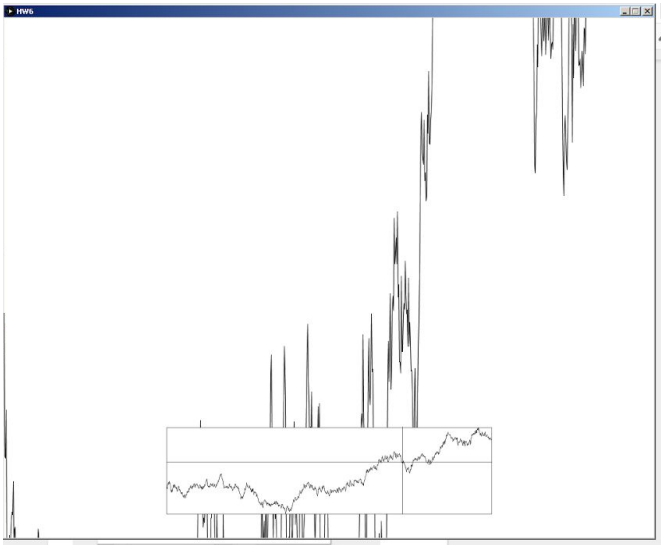
First view presented to user



As the user begins to zoom, the mini-map fades in



The mini-map displays the viewing area as a rectangle



When the viewing area is too small, a crosshair is used to indicate camera position

(B) Navigation

I implemented a zoom + pan navigation technique that mimics that of Google Maps. When zooming in or out by using the mouse wheel, the data points at the current mouse location stay fixed to their screen position, unless the required movement of the camera would render outside the data set range. The user can pan by clicking and dragging.

(C) Real-time Interaction

Real-time interaction is achieved by sampling the dataset at each pixel x coordinate, i.e. each vertical column of pixels contains one sample of the dataset at any given time and when zooming in, the pixels will sample the dataset at a higher granularity.

(D) Dataset size

The application runs at interactive frame rates for 1 billion points.