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Date: Wed, 13 Mar 2002 22:26:46 -0800
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From: Mark Horowitz <horowitz@Stanford.EDU>
Subject: Quals question (finally)
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The quals question was based on building the interface to a dot-matrix display

1. Assume you have an array of 8x128 lights. If you had a wire to control each light how many wires would you need?

1024

2. Clearly that is too many wires. If we want to reduce the wires what can we do?

Need to use memory in the display, and use the fact that the eye is slow. So scan out image a column at a time. This will take 8 wires (one for each row) and either 7 wires for the columns (decode locally), or just two wires -- one for the clock and one for reseting the counter.

3. Now assume that I want to have an analog display rather than just turing the lights on or off. How could I do that?

Simplest solution is to drive an analog voltage on each row line. The light on that row's amplitude will be set but that control.

4. Assume that the actual picture elements are intrinsically digital. Can we still create an analog display?

Sure, use pulse width modulation. Pulse the row so the pulse width is proportional to the desired intensity

5. How does the clock on my desk work?