ECE 280 / CSE 280
Digital Design Laboratory
Lecture 9

Video Memory
Video Memory

- Text-based
  - Memory stores ASCII characters
  - Video Processor has a lookup table that translates characters to bitmap
  - Common formats 80x25 (8x16 characters) or 80x40 (8x12 characters)
Video Memory

- Pixel-based
  - All-points-addressable
  - Memory stores pixels
  - True-color or 24-bit mode
    - Each pixel is stored in a 32-bit word
      - 8-bits for each color
      - 8 remaining bits are blank or used for alpha channel
Video Memory

- Pixel-based
  - 8-bit color
    - Use 8 bits to index into a 256 entry palette
    - Each palette entry has 24 bits
    - Can display 256 colors at a time
    - Can change palette with application change
Lab 8

- Video generator w/access from memory
- Use pixel-based true-color
  - Each 32-bit word contains 8 pixels

```
  7  6  5  4  3  2  1  0
```
- Memory writer should write pixels continuously
  - Alternate colors
  - Each color should be eight pixels wide
Lab 8

- Memory writer should be similar to lab 4
- You may need to insert wait states in the SRAM memory controller
- VGA controller will read from memory during active video display.
  - You will need to read ahead a little bit
  - You will be reading 8 pixels at a time
  - Read pixels 8-15 when you are displaying 0-8