Simple Snake

CECS 361 Fall 2021

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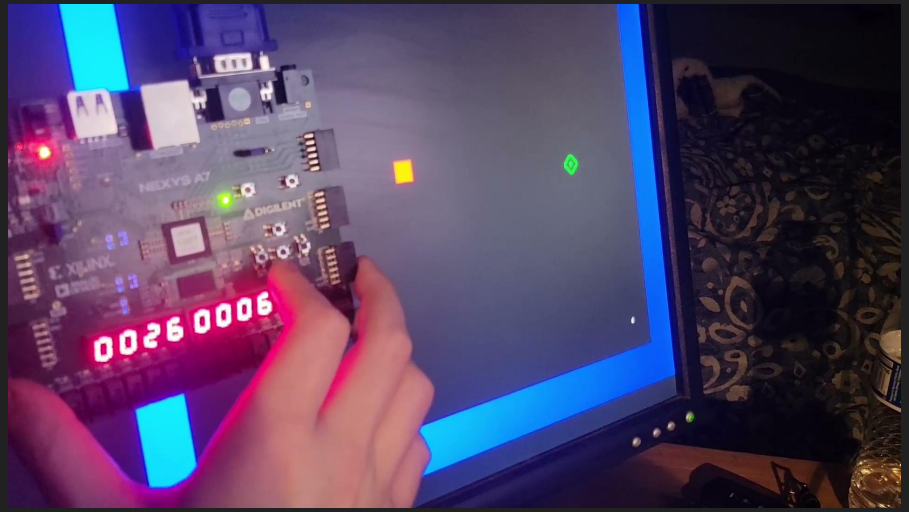
RUNTIME

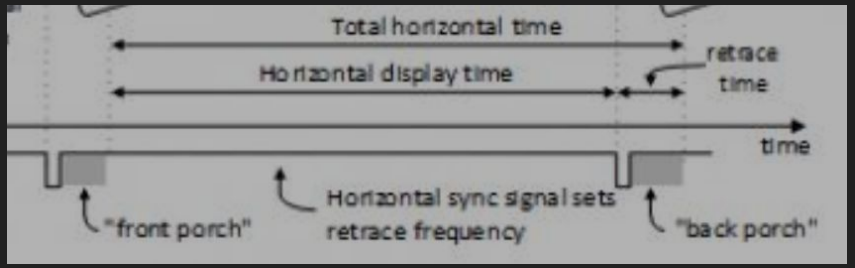
- Controlled via onboard pushbuttons (Left, Right, Up, Down).
- Score increments upon snake colliding with apple.
- Time increments every second.
- Apple randomizes location after being eaten.
- Reset stats and snake position upon colliding with boundary.

Game Runtime



VGA

- 12-Bit RGB output, 4-bits per color.
- 25 MHz Pixel clock



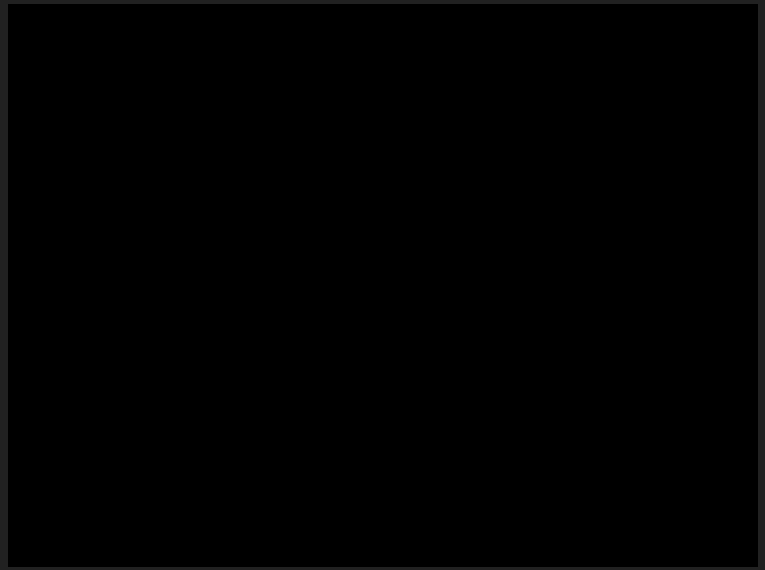
*From board reference manual

VGA timing standard for 640 x 480 resolution @ 60 Hz with a 25 MHz pixel clk

Parameter	Time (Vsync)	Lines (Vsync)	Time (Hsync)	Clks (Hsync)
Sync Pulse	16.7ms	521	32us	800
Display Time	15.36ms	480	25.6us	640
Pulse Width	64us	2	3.84us	96
Front Porch	320us	10	640ns	16
Back Porch	928us	29	1.92us	48

SEVEN SEGMENT

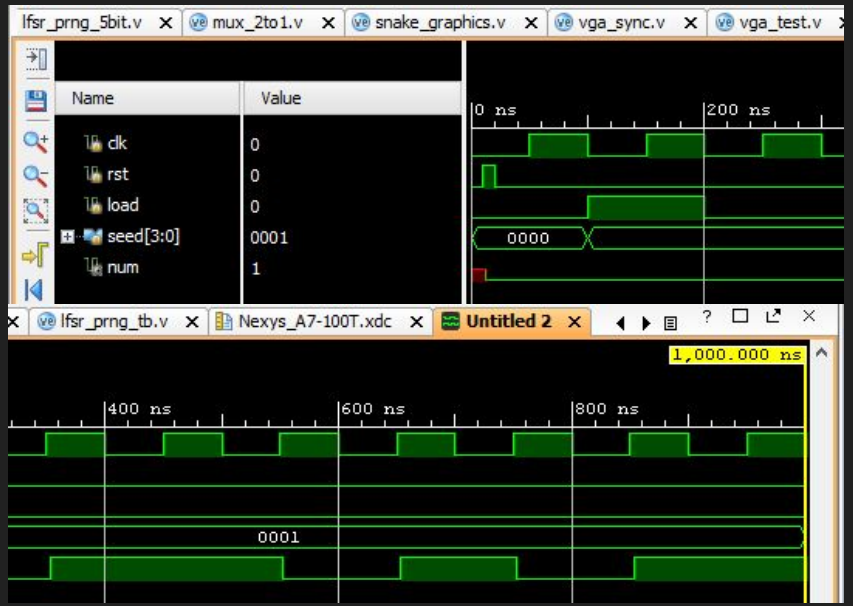
- 8 x 7-Segment Display
- 8 Anodes, 8 Cathodes, shared between digits.
- Display multiplexing is used to display game time (left) and score (right) with limited connections.
- Switching between digits occurs so quickly, human eye perceives image at static.



An example of the display multiplexing slowed down to 4Hz

LINEAR FEEDBACK SHIFT REGISTER

- We implemented a Linear Feedback Shift Register to generate a Pseudo-Random sequence that outputs 5-bit number per generator. Our pseudo-random sequence has a period of 15 clk cycles before it overflows and repeats from the first value.



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