

Computer Science 141 Lab #2 Prelab

Due September 17-18, Start of lab

You will be using a “7 Segment Display” to display a hexadecimal digit. If you’ve ever used a microwave or pocket calculator, you’ve already used one.

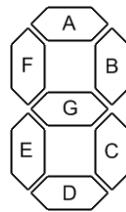


Figure 1: 7 Segment Display

By selecting which of the seven segments (A to G) you light up, you can display different digits. You’ve probably only seen these used for decimal digits, but since you’re not satisfied by the status quo, let’s do hex!

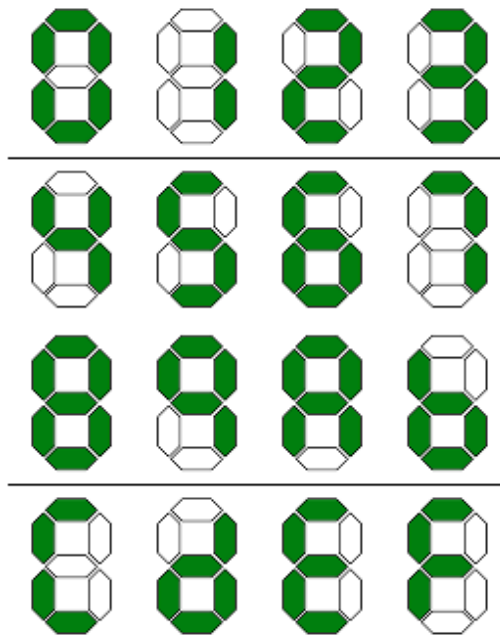


Figure 2: Hexadecimal Digits on a Seven Segment Display

As shown in Figure 2, you will select which of the LED segments to light up to show the correct digit. On our FPGA boards, the LED segments are active-high, meaning that a 1 will turn them on, and a 0 will turn them off. To prepare for the lab, you should write an equation for each of the seven segments based on a four-bit hex digit input. First, you will want to fill out the following truth table:

Digit	Digit ₃	Digit ₂	Digit ₁	Digit ₀	A	B	C	D	E	F	G
0x0											
0x1											
0x2											
0x3											
0x4											
0x5											
0x6											
0x7											
0x8											
0x9											
0xA											
0xB											
0xC											
0xD											
0xE											
0xF											

Note: "0x" means the number is in hexadecimal

Second, write out an equation for each of the LED segments, A through G. Please simplify your equations using whichever method you prefer (algebraic, K-map).

Hand In

Please hand in your completed truth table and optimized segment equations at the start of lab.