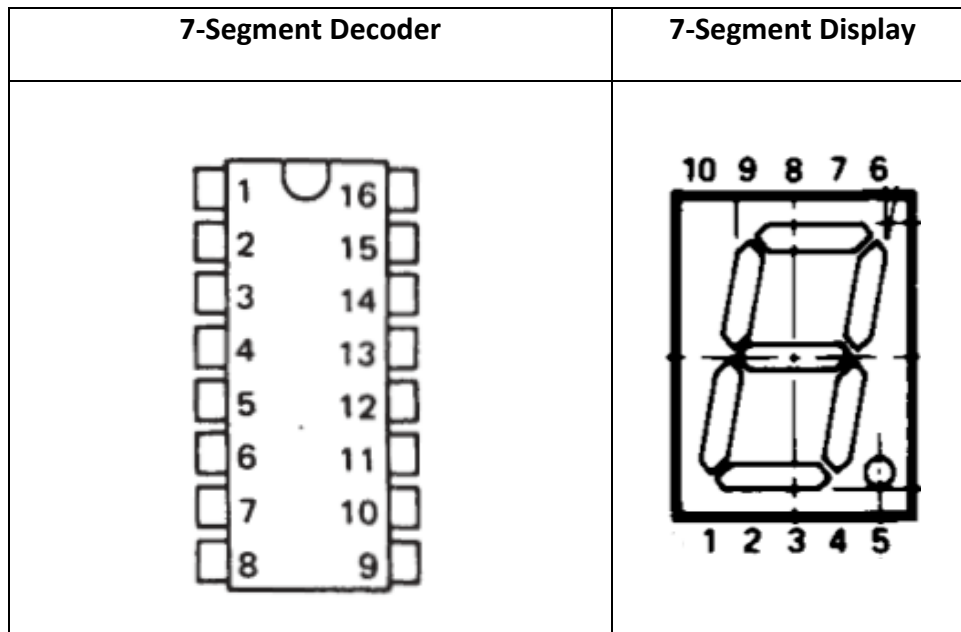


ECE 2140
Experiment 8 Prelab
Seven Segment Decoder

1. Read through Experiment 8.
2. Look up the data sheets for the parts used in the experiment.
 - a. Label all pins according to the data sheet:



- b. Find the following specifications

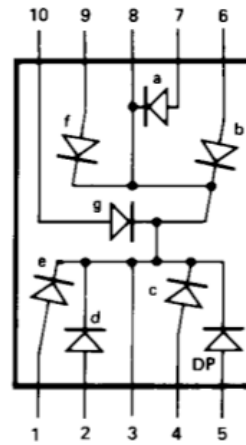
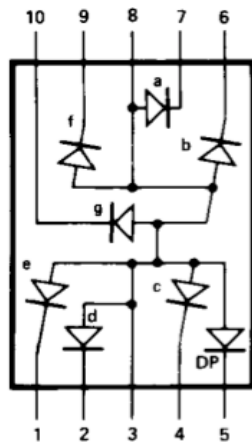
Recommended (Nominal) Operating Voltages	
7-Seg Decoder	
V_{CC}	
V_{IL}	
V_{IH}	
V_{OL}	
V_{OH}	

3. Fill out the truth table

Find out how a 7-segment decoder operates from the data sheet, and fill out the following truth table:
Hint: look at page 3 of the 74LS48 datasheet. There are nice diagrams of each number being displayed.

Input		Output						
Decimal	Binary	a	b	c	d	e	f	g
	0000							
	0001							
	0010							
	0011							
	0100							
	0101							
	0110							
	0111							
	1000							
	1001							

4. Briefly describe (1-2 sentences) how a common cathode display and a common anode display work.
Hint: one of the following diagrams implements a common cathode display, and the other is common anode. Label them accordingly.



Name: _____

Lab Section: _____

5. Draw how you would connect all three chips (DIP Switch, BCD-to-Seven-Segment Decoder, 7-Segment Display) on the breadboard for the experiment:

6. **(Extra Credit** – submit at beginning of lab) Derive your own gate-level implementation (AND, OR, etc.) of a 7-segment decoder. Show all work.