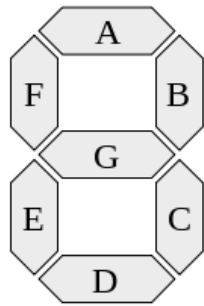


CMSC250H: Honors Supplement to Homework 3

September 24, 2014

A seven segment display is a commonly used electronic component for displaying the digits 0-9. Then figure below shows a 7-segment display. The table shows which segments are lit for each digit.

	Digit	A	B	C	D	E	F	G
	0	on	on	on	on	on	on	off
	1	off	on	on	off	off	off	off
	2	on	on	off	on	on	off	on
	3	on	on	on	on	off	off	on
	4	off	on	on	off	off	on	on
	5	on	off	on	on	off	on	on
	6	on	off	on	on	on	on	on
	7	on	on	on	off	off	off	off
	8	on	on	on	on	on	on	on
	9	on	on	on	on	off	on	on

1. (30 points) Create a digital circuit that accepts a 4-bit number $x_3x_2x_1x_0$ representing a single digit. The circuit should have a single output that is 1 if segment “A” should be lit for the input digit, and 0 otherwise (Hint: it’s much easier to write a circuit that determines when “A” should be off than when it should be on).

2. (70 points) Using the principles you learned in question 1, create a circuit that accepts 4 input bits, and has seven outputs, one per display segment.