

Computer Project #2

Assignment Overview

This assignment develops familiarity with combinational circuits. You will design the combinational circuits specified below.

It is worth 40 points (4% of course grade) and must be completed no later than 11:59 PM on Thursday, 9/13.

Assignment Deliverable

The deliverable for this assignment is the following file:

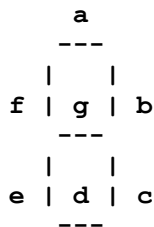
proj02.design – the text file containing your design

Be sure to use the specified file name and to submit it for grading via the CSE handin system before the project deadline.

Assignment Specifications

~~Consider your~~ your nine-character MSU PID as a sequence of **hexadecimal** digits. You will design combinational circuits which recognize those digits and map them to the appropriate segments in a seven-segment display.

~~A seven-segment~~ display uses seven LEDs to represent hexadecimal digits. Assuming the seven segments are labeled as shown below, then each digit can be displayed by lighting a subset of the segments.



~~For example,~~ the hexadecimal digit '9' can be displayed by lighting all of the segments except segment e. **Similarly,** the hexadecimal digit 'A' can be displayed by lighting all of the segments except segment d.

Your circuits will **accept four inputs** (the four bits in a hexadecimal digit) and will produce **eight outputs**: the **"Present" signal** and the seven signals associated with the seven-segment display.

The "Present" signal will be asserted when the four input signals represent a hexadecimal digit in your personal MSU PID; it will be deasserted for all other cases. That is, **the function will recognize the hexadecimal digits which are present in your MSU PID.**

For each hexadecimal digit which appears in your MSU PID, the circuits will produce the correct value for each of the display signals. **Otherwise, the value of each display signal is irrelevant.**

Your design will be formalized by copying the file `"/user/cse320/Projects/project02.design"` into your account as the file `"proj02.design"`, then editing that file to include the requested information.

Assignment Notes

1) The following chart indicates which segments are used for a given hexadecimal digit.

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0	a, b, c, d, e, f
1	b, c
2	a , b , d , e , g
3	a, b, c, d, g
4	b , e, f , g
5	a , e , d , f, g
6	a, e , d , e , f , g
7	a , b , c
8	a , b , e , d , e , f , g
9	a, b, c, d, f, g
A	a, b , e , e , f , g
B	c, d, e, f, g
C	a, d, e, f
D	b, c, d, e, g
E	a, d, e, f, g
F	a, e, f, g

2) The minimized expressions for your eight functions must be given in sum of products form. That is, each function must be expressed using one or more products (AND terms), and at most one sum (OR term).

3) In Project #3, you will implement and test the circuits which you designed using the “sim” software package.