

CSC 244 Fall 2022 Homework 4

Combinational Building Blocks

Due: Wednesday, Sept. 21 before 9 am to D2L

1. Implement the function in Fig. 2.45 in the text book. using the combinational building blocks listed. **Clearly label your inputs and outputs according to the function.** Label your LSB/MSB clearly.
 - i. An 8:1 multiplexer
 - ii. A 3:8 decoder with *active-low* outputs

2. Implement the following MUX networks using the MUX sizes [in brackets]. Clearly label your most and least significant input and select bits.
 - i. 4:1 [using 2:1s]
 - ii. 16:1 [using 4:1s]

3. Implement a 4:16 decoder trees using a decoder tree of sizes using 3:8 and 1:2 with active-high enables and outputs. Clearly label your most significant inputs and outputs.

4. Write the output equation for Y_{97} for a 7:128 decoder. The decoder takes an active low enable (Eb) and 7-bit address ($A_{6:0}$) as inputs, and outputs a 128-bit one-hot output ($Y_{127:0}$). **Show your work.**