PHYS 375: Lab 12 – Multiplexers –

Purposes
Build and use circuit based on multiplexers and decoders.

1 Digital multiplexer

Build the circuit shown in Figure 1. Use a 1 kΩ SIP resistor network and an 8-bits DIP switch for the data input.

1. Set the input data D7-D0 to 10101100 and make a truth table for the output Q.

2. A variant of this circuit was discussed in the class, briefly remind what it is supposed to do and why the D7-D0 switch were chosen per the values aforementioned.

3. Does this system behave as a prime number generator?

![Figure 1: Circuit for part 1.](image)

2 Seven segment display

Build the circuit shown in Figure 2. Note that each switch should be connected to one input of the display.

1. Which switch turns on which light?

2. Make a table with all possible cases.
3 Four-bits decoder

Add a decoder on the previous circuit to modify the circuit accordingly to what shown in Figure 3.

1. Make a truth table for all possible input for the decoder, its outputs and the displayed pattern
2. Conclusion – what do you display?
Figure 4: Nomenclature for the three devices used in this lab.