

# Lab 1 & 2

Intro to Digital Logic  
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## Task #1

*A simple, accurate explanation of what the `mux4_1` circuit does:*

The output is equal to:

- The `i00` input when `sel0==0` and `sel1==0`
- The `i01` input when `sel0==1` and `sel1==0`
- The `i10` input when `sel0==0` and `sel1==1`
- The `i11` input when `sel0==1` and `sel1==1`

## Task #2

*The value of the signal (TRUE OR FALSE) that makes the LEDs light up.*

A signal value of TRUE will make an LED light up.

*The position of the switches (up or down) that cause them to output TRUE.*

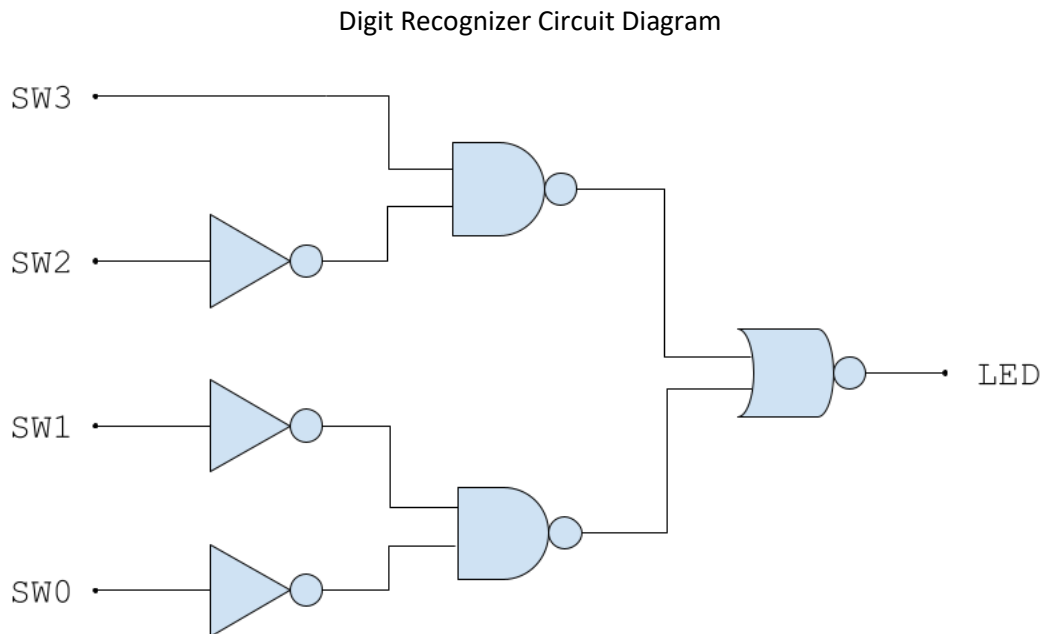
When a switch is in the *up* position, it will output a value of TRUE.

*The position of the pushbuttons (pressed or unpressed) that cause them to output TRUE.*

When a pushbutton is in the *unpressed* position, it will output a value of TRUE.

### Task #3

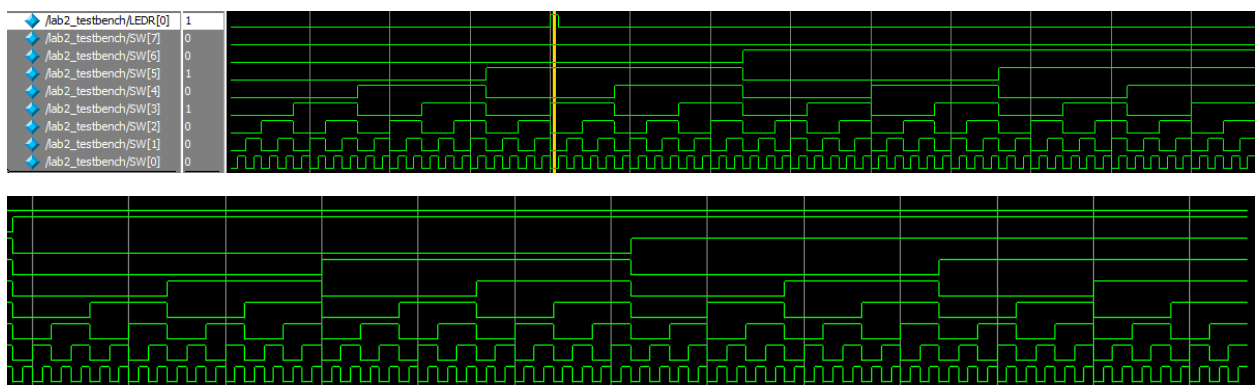
A circuit diagram of your 1-digit recognizer circuit.



This circuit takes in a 4-bit integer, encoded by switches 0-3, and outputs 1 if and only if it receives an input of 8.

A screenshot of the ModelSim simulation for your 2-digit recognizer design.

2-Digit Recognizer Simulation Screenshot



This simulation runs through all 256 possible 2-digit inputs and shows when the output is TRUE. Notice that the output signal is TRUE only when the input encodes the hex digits '28'. (See the position of the cursor)

## Time Estimation

This lab took approximately 3 hours, in total, to complete.