Lab 1 & 2

# Intro to Digital Logic

## Connor Aksama – 1778028

### 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.

Digit Recognizer Circuit Diagram

*A picture containing text, clock, gauge

Description automatically generated*

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

A screenshot of a computer

Description automatically generated with medium confidence

A picture containing clock

Description automatically generated

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.