Topics for today:

Introduction to electronics
(preparation for lab)

Back to circuits (maybe)

(Oversimplified!)
Introduction to Electronics

Electronics concepts

- Conductor
- Insulator
- Resistor
- Ground

Electronics concepts

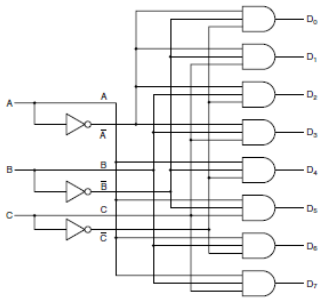
- Semiconductor
- Diode
  - Light-emitting diode (LED)
- Transistor

Decoder

A *decoder* has *n* input lines and 2^n output lines.

At any time exactly one of the output lines is equal to 1. This line is selected by the pattern of inputs, which we can interpret as a binary code for that line's number.

3-to-8 Decoder



Multiplexer ("MUX")

A *multiplexer* (or *channel selector*) has 2^n data input lines, *n* control input lines, and one output line.

The control lines select which of the input lines is connected to the output line.

Arithmetic logic unit (ALU)

An *arithmetic logic unit (ALU)* is a circuit which allows selection from a variety of basic logic and arithmetic operations to be applied to inputs. It combines several of the basic circuits.

Several one-bit ALU's can be linked together to form a multi-bit ALU.

Flip-flop

A *flip-flop* is a 1-bit memory circuit.

SR Flip-flop

S = Set (make equal to 1)

R = Reset (make equal to 0)

Clocked flip-flops

A clocked flip-flop can only be set or reset (i.e., data can be stored) when the Clock line permits it.