Merve Müge Deliktaş

Finite State Machine

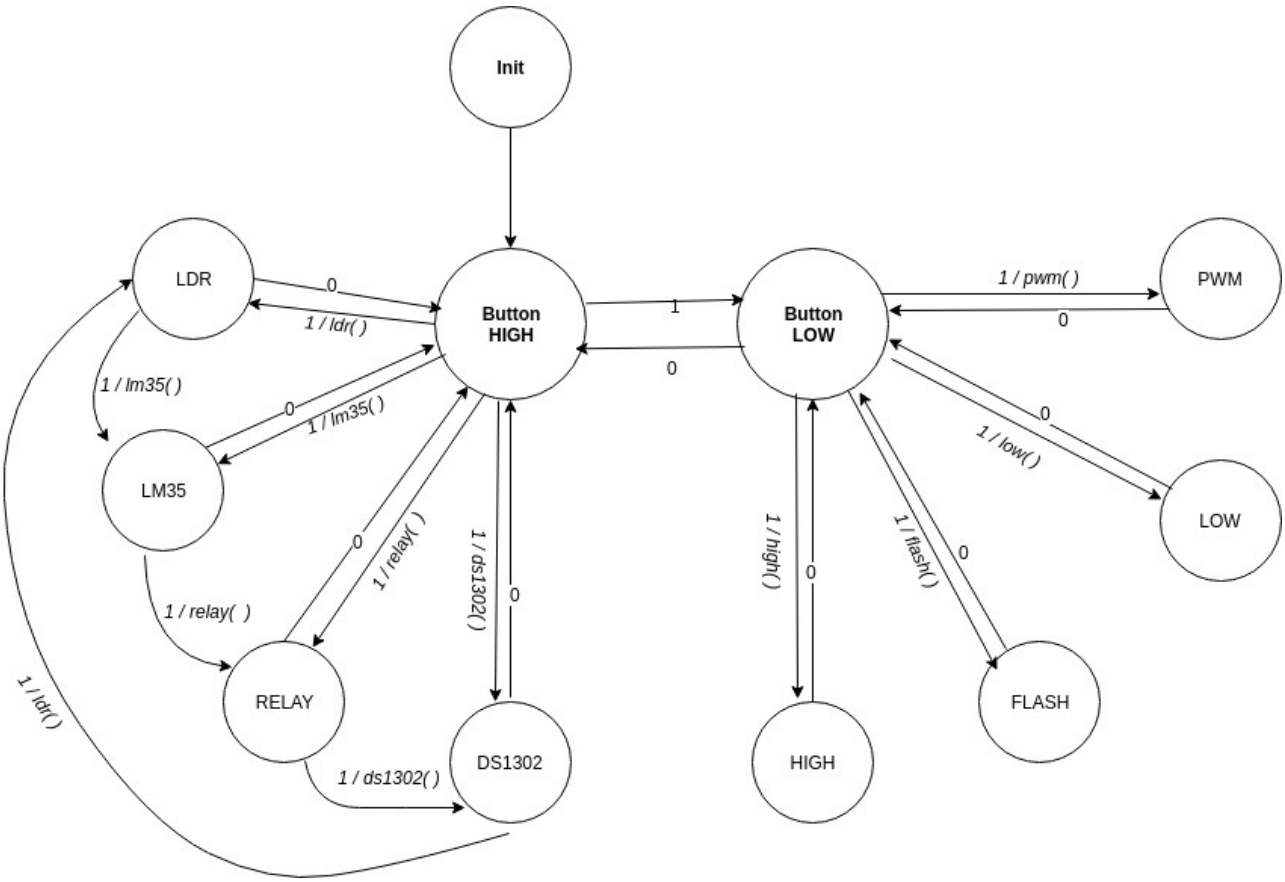
A Finite State Machine (FSM) is an abstraction that describes the solution to a problem very much like an Algorithm.

Unlike an algorithm which gives a sequence of steps that need to be followed to realize the solution to a problem, a FSM describes the system as a machine that changes states in reaction to inputs and produces appropriate outputs.

Many systems in engineering can be described using an FSM.

First let's define what are the essential elements that constitute an FSM.

1. A finite set of states that you can find the system in. One of these states has to be identified as the initial state.
2. A finite set of external inputs to the system.
3. A finite set of external outputs that the system generates.
4. An explicit specification of all state transitions. That is, for every state, what happens (as in, which state will the system transition to) when you are in that state and a specific input occurs?
5. An explicit specification of how the outputs are determined. That is, when does a specific output get generated?



In this project, The main criterion is button situation. The type of operation varies dependent to the state of the button. If the button is high, the system would work on sensors in sequentially. When the button is pressed, the system would cross to the led status control mechanizm. The system status determined by applying the modulo operation using 4 as basis.

Sensors

LDR:

An LDR or light dependent resistor is also known as photo resistor, photocell, photoconductor. It is a one type of resistor whose resistance varies depending on the amount of light falling on its surface. For instance, when the LDR is in darkness, then it can be used to turn ON a light or to turn OFF a light when it is in the light.

LM35:

LM35 is a commonly used temperature sensor, It shows values in the form of output voltages instead of degree Celsius.

It is used in industries and commercial buildings where high accuracy of temperature measuring is needed.

Relay:

A relay is an electromagnetic switch operated by a relatively small electric current that can turn on or off a much larger electric current. The heart of a relay is an electromagnet (a coil of wire that becomes a temporary magnet when electricity flows through it). We can think of a a relay as a kind of electric lever.

Why is that useful?

Many sensors are incredibly sensitive pieces of electronic equipment and produce only small electric currents. But often we need them to drive bigger pieces of apparatus that use bigger currents. Relays bridge the gap, making it possible for small currents to activate larger ones.

That means relays can work either as switches (turning things on and off) or as amplifiers (converting small currents into larger ones).

DS1302:

The DS1302 is a Real Time Clock (RTC) or Time Keeping Chip with a build-in Trickle-Charger.

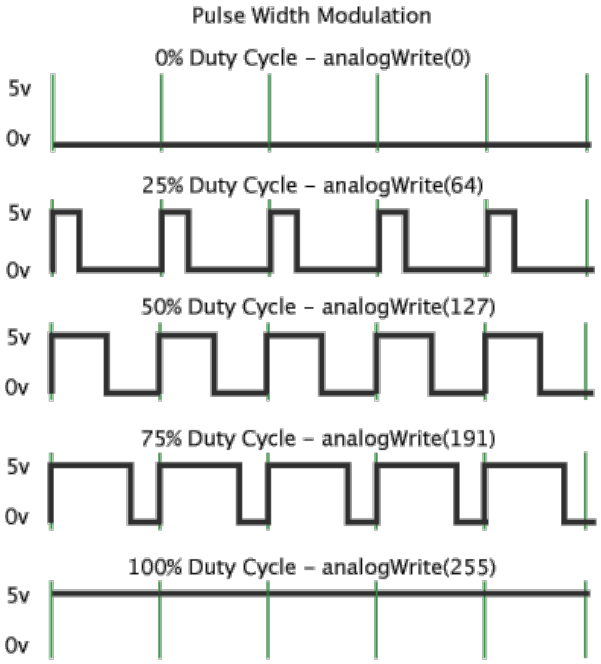
Led Control Alternative

High:
Turn the light on.

Low:
Turn the light off.

Flash:
Light turn on and off sequentially.

PWM:



By increasing or decreasing pulse width, the controller regulates energy flow to the LED.