

Automatic Water Pump

Objective:

Design and automate a water pumping system to pump water from a reservoir to a storage tank. The pump should stop when the tank fills completely, and should not run until the tank becomes half-full.

Project kit:

- Arduino UNO
- Water level sensor
- Water pump
- Water tank + reservoir
- 2x water tube
- Batteries
- MOSFET

Method:

A water sensor was connected to the arduino to get the water level of the water tank, details about how to use the sensor can be found here: [Water Sensor | Arduino Tutorial](#)

After that an N-Type MOSFET was used to operate the water pump using an external battery. That was performed by first connecting the water pump Positive pole directly to the battery, and the battery Negative pole to the Gnd pin in the arduino then to the source pin in the MOSFET. The mosfet's drain pin was connected directly to the Negative pole of the water pump. The mosfet's gate pin was connected to the D8 pin through 2 transistors first (to offload the load on the arduino, Two transistors had been used due to the shortage of the needed transistor). Extra details about this can be found here:

<https://www.youtube.com/watch?v=DLd5dUychY8->

In code, in the Setup function, the D7 and D8 pins have been initialised as output pins, then made sure that both are set to LOW. In the Loop function first the water sensor has been turned on to read it's value for 10 milliseconds then closed, after that it's value is used to determine whether should the water pump turn on or off depending on the value if it's more than or equal to 0 and less than 30, in that case it will be turn on, otherwise it won't stop until it reaches 280. after that 1 second would be delayed before looping again.

Code for the project:

```
AutomaticWaterPump.ino

1 #define POWER_PIN 7
2 #define GATE_PIN 8
3 #define SIGNAL_PIN A5
4
5 int value = 0; // variable to store the sensor value
6
7 void setup()
8 {
9     Serial.begin(9600);
10    pinMode(POWER_PIN, OUTPUT); // configure D7 pin as an OUTPUT
11    pinMode(GATE_PIN, OUTPUT); // configure D8 pin as an OUTPUT
12
13    digitalWrite(POWER_PIN, HIGH); // turn the sensor ON
14    digitalWrite(GATE_PIN, LOW); // turn the sensor OFF
15 }
16
17 void loop()
18 {
19     value = analogRead(SIGNAL_PIN); // read the analog value from sensor
20
21     Serial.print("Sensor Value: ");
22     Serial.println(value);
23
24     if (value >= 0 && value <= 30)
25         digitalWrite(GATE_PIN, HIGH); // Turn on the water pump only and only if the water level drops below 30
26     else if (value >= 300)
27         digitalWrite(GATE_PIN, LOW); // Turn off the water pump if the water level exceeds 300
28 }
29
```

Pictures of the project and wirings:







