Microprocessor Project Report
Phase 2

Group 1 - Smart Water Tap

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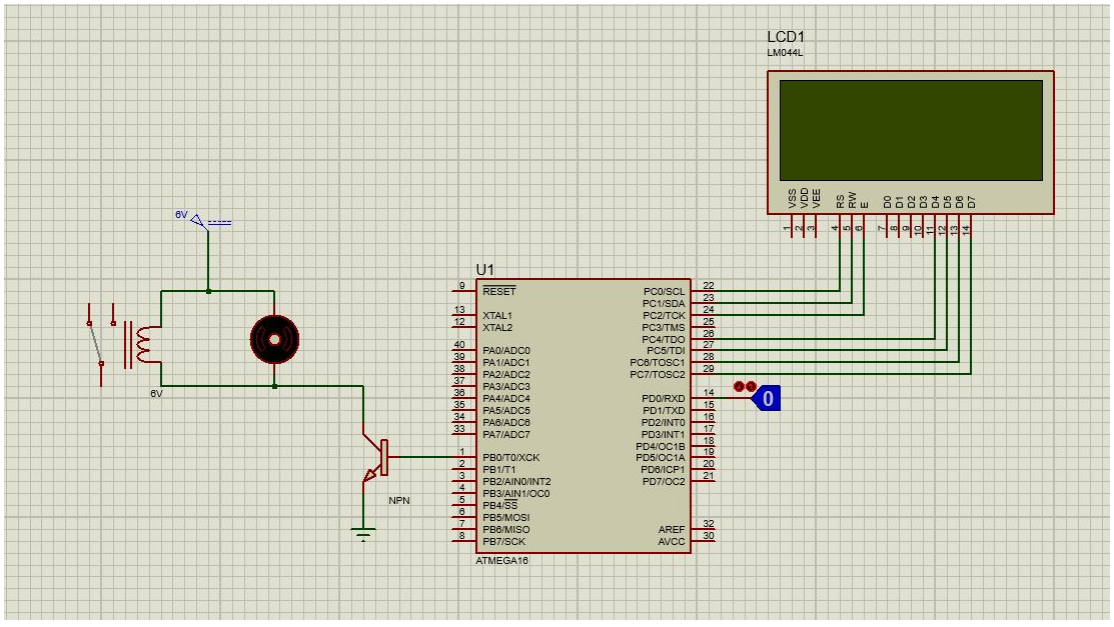
The second phase of our Microprocessor Project started with two goals according to the main proposal: Creating a simplified simulation of the circuit in Proteus and developing a working code for the said simulation.

The circuit simulation:

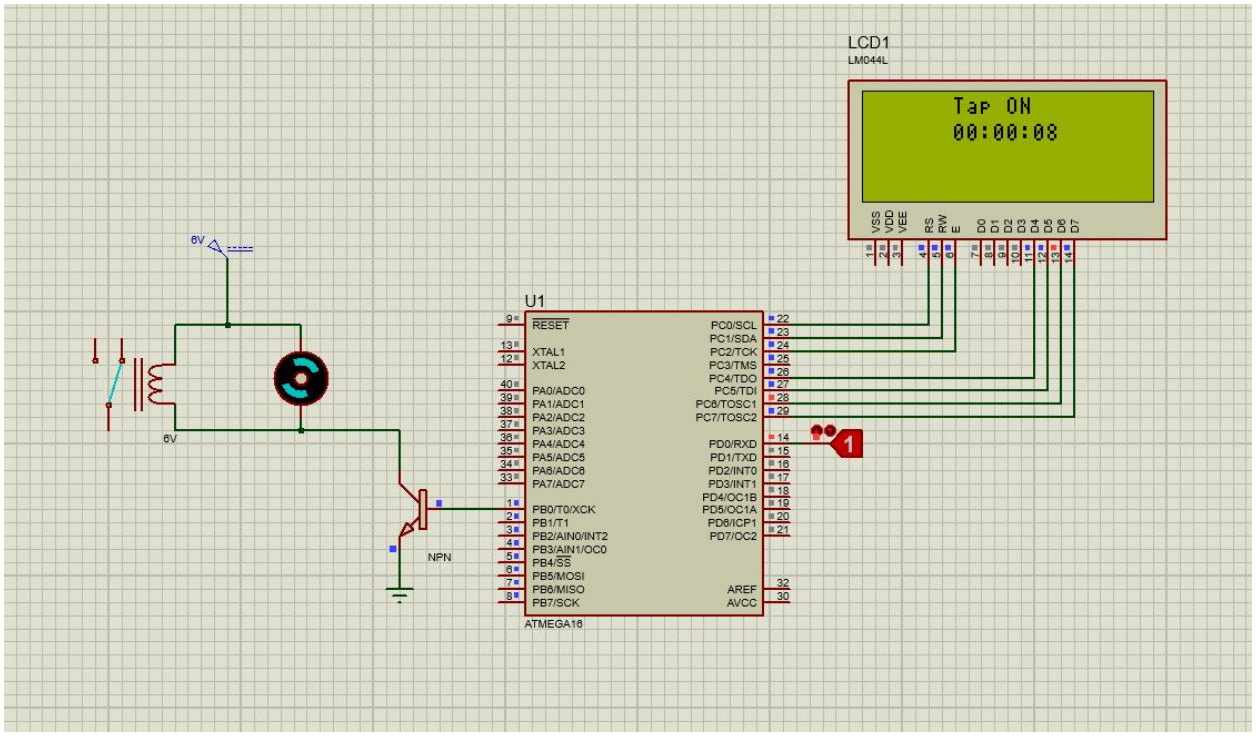


The main project detects the user's hands by using a sensor, and then opens the tap water for the user to use, and an LCD shows the duration of the tap being open. When the user removes their hand, the tap turns off and the final tap open-state duration will be shown on the LCD as the result.

In this simulation, we have modeled the sensor as a logic state, 1 for when the hand is detected and 0 for when the hand is Removed. The water tap is modeled by a Motor/Relay, which turns on and rotates like the real life tap when the sensor state is 1.

The Motor is connected to a 6 volts DC Generator because the smart tap works with a 6 volts system.

The simulation when its turned on:



The Code:

The code is written in C using CodeVision AVR. Further Comments about the mechanism are available in the Source Code.

```
//tanzim portD b onvane vooroodi - bekhatere vaqfe hae khareji
DDRD=0x00;
PORTD=0x00;

//tanzimate timer - har 1 sanie vaqfe khahim dasht ta betoonim 1 sanie hae daqiq hesab konim
TCCR1A=(0<<COM1A1) | (0<<COM1A0) | (0<<COM1B1) | (0<<COM1B0) | (0<<WGM11) | (0<<WGM10);
TCCR1B=(0<<ICNC1) | (0<<ICES1) | (0<<WGM13) | (0<<WGM12) | (1<<CS12) | (0<<CS11) | (0<<CS10);
TCNT1H=0x85;
TCNT1L=0xEE;
ICR1H=0x00;
ICR1L=0x00;
OCR1AH=0x00;
OCR1AL=0x00;
OCR1BH=0x00;
OCR1BL=0x00;
TIMSK=(0<<OCIE2) | (0<<TOIE2) | (0<<TICIE1) | (0<<OCIE1A) | (0<<OCIE1B) | (1<<TOIE1) | (0<<OC

//tanzim LCD
lcd_init(20);


while (1)
      {
        if (PIND.0 == 0)
        {
```

Next Steps:

Physical implementation with the parts and changing our code so that it matches the real life properties of the parts.

Challenges that we encountered:

- Designing the circuit in a way that matched the real life Functions of the electronic parts
- Handling time delay and interrupt libraries