**MAE 598 MEDM: Lab # 2**

Group 9: Tolemy Nibi, **Tushar Vishwanath**, Anand Anil Kumar, Sobha Srujana Patri

MAE 598: Topic: Mechatronics Engineering for Design & Manufacturing (MEDM)

Professor Cindy (Xiangjia) Li

February 10, 2024

Question - LAB 2

Write a brief document to describe what you did for the lab assignment, including:

* Pictures of your setup
* Circuit schematic diagram
* Codes
* Comments

An automation system for dispensing and drying paint

When water is poured onto a paper towel, which gets wet, the yellow LED and red LED will blink. Motor fan will turn on until the paper is dry. The red LED and green LED will alternately blink with half a second.

Hint: RC circuit

**Physical Set Up**

|  |
| --- |
| Circuit Diagram with connections. |
| Figure 1 & 2 |

|  |
| --- |
|  |
| Figure 1 |

A circuit diagram with all essential connections has been shown above in Figure 1. We have shown all the electrical components( non-circuit components such as tissue paper are avoided).

|  |  |  |
| --- | --- | --- |
| *The circuit diagram (actual connections)*   |  | | --- | | Components in the system | | Figure 2 | |
| Figure 2 |

*The components used in the setup along with the quantities used is listed in Figure 2*

**Circuit Schematic Diagram**

|  |
| --- |
| Circuit Schematic Diagram |
| Figure 3 |

|  |
| --- |
|  |
| Figure #: 3 |

[Video of circuit demonstration](https://drive.google.com/file/d/1KIIYhr_td4TM-4248duJK8UjsaMCqZqR/view?usp=sharing)  
<https://drive.google.com/file/d/1KIIYhr_td4TM-4248duJK8UjsaMCqZqR/view?usp=sharing>  
  
*We have linked the video of the playback generated in TinkedCAD.*

*Since we cannot add components such as tissue paper, we have generated a simple video in a situation where the tissue acts as a perfect conductor(closed circuit). You can notice the speed output on the motor in RPM when the circuit is connected at 5V input (check RPM that shows up on the motor in the video).*

**Comments:**

* The system utilizes an RC circuit to detect the wetness of the paper towel.
* When the paper towel is wet, the yellow and red LEDs blink alternately, indicating the activation of the drying process.
* The motor fan is turned on to dry the paper towel until it reaches the dry state.
* Once the paper towel is dry, the red and green LEDs blink alternately.
* Ensure proper spacing and connections in the circuit for optimal performance.

**Code(s)**

|  |
| --- |
| //Write a brief document to describe what you did for the lab assignment, including:  // Pictures of your setup  // Circuit schematic diagram  // Codes  // Comments  // An automation system for dispensing and drying paint  // When water is poured onto a paper towel, which gets wet, the yellow LED and red LED will blink. Motor fan will turn on until the paper is dry. The red LED and green LED will alternately blink with a half second interval.  // Hint: RC circuit    int chargePin = 9;  int dischargePin = 8;  long result = 0;  long tolerance = 0;  int motorPin = 10;  int Greenled = 11;  int Redled = 12;  int Yellowled = 13;  void setup() {  Serial.begin(9600);  pinMode(motorPin, OUTPUT);  pinMode(Redled, OUTPUT);  pinMode(Yellowled, OUTPUT);  pinMode(Greenled, OUTPUT);  pinMode(chargePin, OUTPUT);  pinMode(dischargePin, OUTPUT);  }  void loop() {  tolerance = RCtime(dischargePin);  if (tolerance < 500) {  digitalWrite(Yellowled, HIGH);  digitalWrite(Redled, HIGH);  delay(500);  digitalWrite(Redled, LOW);  digitalWrite(Yellowled, LOW);  delay(500);  analogWrite(motorPin, HIGH);  } else {  digitalWrite(Redled, HIGH);  delay(500);  digitalWrite(Redled, LOW);  digitalWrite(Greenled, HIGH);  delay(500);  digitalWrite(Greenled, LOW);  analogWrite(motorPin, 0);  }  }  long RCtime(int dischargePin) {  long result = 0;  pinMode(dischargePin, OUTPUT);  digitalWrite(dischargePin, HIGH);  pinMode(dischargePin, LOW);  digitalWrite(dischargePin, LOW);  while (digitalRead(dischargePin)) {  result++;  }  return result;  } |
| Note - In case of spacing issues the txt file has been attached here - [txt](https://docs.google.com/document/d/1WhLeZAi0J_L8eU4KdneY5ldwUSoKtvCTR-QiY1DgNEk/edit) |

**Closing Comments:   
We hope to demonstrate this in class since we have used a simpler/compact code to run this test case.**