Activity 7: Multiple DC Motor with Temperature Sensor:

Description:

This circuit has multiple DC motors that will turn on if a specific temperature is reached.

Materials:

1 Arduino Uno R3
1 Breadboard
3 DC Motor
1 Temperature Sensor [TMP36]
Wires

Codes:

```
int tempPin = A0;
int fan1 = 11;
int fan2 = 10;
int fan3 = 9;
float temp;
int fanSpeed;
int tempMin1 = 20.00;
int tempMax1 = 30.00;
int tempMin2 = 31.00;
int tempMax2 = 40.00;

void setup() {
  Serial.begin(9600);
  pinMode(fan1, OUTPUT);
  pinMode(fan2, OUTPUT);
  pinMode(fan3, OUTPUT);
  pinMode(tempPin, INPUT);
 }

void loop() {
```

```
  temp =(analogRead(tempPin)* 0.48828125);
  Serial.print(temp);
   if(temp  < tempMin1) {
      digitalWrite(fan1, LOW);
     digitalWrite(fan2, LOW);
     digitalWrite(fan3, LOW);
   }
    if((temp  >= tempMin1) && (temp <= tempMax1)) {
      digitalWrite(fan1, HIGH);
     digitalWrite(fan2, LOW);
     digitalWrite(fan3, LOW);
   }
  if((temp  >= tempMin2) && (temp <= tempMax2)) {
      digitalWrite(fan1, HIGH);
    digitalWrite(fan2, HIGH);
    digitalWrite(fan3, LOW);
   }
  if(temp  >= tempMax2) {
      digitalWrite(fan1, HIGH);
    digitalWrite(fan2, HIGH);
    digitalWrite(fan3, HIGH);
   }
  delay(1000);
}
```

Explanation to Codes:

int tempPin = A0;
int fan1 = 11;
int fan2 = 10;
int fan3 = 9;
float temp;
int fanSpeed;

- First, we declare our variables with names.

```
int tempMin1 = 20.00;
int tempMax1 = 30.00;
int tempMin2 = 31.00;
int tempMax2 = 40.00;
```

- We have 3 DC motors, the DC motors will only turn on if it reaches a certain temperature.

The conditions:

- If the temperature reaches 20 - 30 degrees Celsius, 1 DC motor will turn ON.
- If the temperature reaches 31 - 40 degrees Celsius, 2 DC motors will turn ON.
- If the temperature reaches above 40 degrees Celsius, all 3 DC motors will turn ON.
- and If the temperature is below 20 degrees Celsius, all DC motors will turn OFF.

Therefore, we declare our minimum and maximum temperature for each DC motor.

```
void setup() {
  Serial.begin(9600);
  pinMode(fan1, OUTPUT);
  pinMode(fan2, OUTPUT);
  pinMode(fan3, OUTPUT);
  pinMode(tempPin, INPUT);
 }
```

- In void setup(), we begin by “Serial.begin(9600)” for the data transmission.
- Next, we declared the variables as input or outputs.

```
void loop() {
  temp = (analogRead(tempPin)* 0.48828125);
```

```
Serial.print(temp);
```

- In void loop(), we started with declaring the analog reading of “tempPin” multiplied by 0.48828125 will be the value of “temp.”
- Next line is the sending of the value “temp” with the “Serial.print” code.

```
if(temp  < tempMin1) {
    digitalWrite(fan1, LOW);
   digitalWrite(fan2, LOW);
   digitalWrite(fan3, LOW);
  }
```

- Next, is an if statement with the condition of “If the value of “temp” is less than the value of “tempMin1”, it will turn off all three fans.”

```
if((temp  >= tempMin1) && (temp <= tempMax1)) {
      digitalWrite(fan1, HIGH);
     digitalWrite(fan2, LOW);
     digitalWrite(fan3, LOW);
   }
```

- Ths if statement has the condition of “if the value of “temp” is greater than or equal to “tempMin1” and less than or equal to “tempMax1,” it will turn on “fan1” or the first fan.”
- In this section, it will turn on 1 fan if the temperature is above 20C and below 30C.

```
if((temp  >= tempMin2) && (temp <= tempMax2)) {
      digitalWrite(fan1, HIGH);
    digitalWrite(fan2, HIGH);
    digitalWrite(fan3, LOW);
   }
```

- Another if statement with the condition of “if the value of “temp” is greater than or equal to “tempMin2” and less than or equal to “tempMax2,” it will turn on “fan1” and “fan2” or the first and second fan.”
- In this section, it will turn on 2 fans if the temperature is above 31C and below 40C.

```
if(temp  >= tempMax2) {
      digitalWrite(fan1, HIGH);
    digitalWrite(fan2, HIGH);
    digitalWrite(fan3, HIGH);
   }
```

- This last if statement has the condition of “if the value of “temp” is greater than or equal to “tempMin2” and less than or equal to “tempMax2,” it will turn on “fan1” and “fan2” or the first and second fan.”
- In this last section, it will turn on all 3 fans if the temperature is greater than 40C.

```
  delay(1000);
}
```

- Lastly, we added a 1 second delay.