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Internship Projects

Project 1: Automatic room temperature controller

Abstract:

Creating an automatic room temperature controller using Arduino in tinker cad.

Introduction:

Using these components LED,LCD, Potentiometer,a DC motor as a fan, arduino and breadboard a automatic room temperature controller is created and the inputs are given for a normal room temperature, Higher room temperature and for a Lower room temperature. The results are captured according to the given inputs.

Methodology:

a. Place an Arduino UNO, breadboard and a LCD 16x2 in the platform.
b. A potentiometer is placed on the breadboard to control the brightness of the LED.
c. A temperature sensor is placed on the breadboard.
d. A connection is made from GND of LCD to negative terminal of pin number 20 in the breadboard.
e. VCC and V0 of LCD are connected to positive terminal of pin 21 and pin 17 of j in the breadboard respectively.

f. The first and last pins of potentiometer is connected to pin 16 to negative terminal and pin 18 to positive terminal.
g. R5 of LCD is connected to 12 pin of arduino. RW of LCD is connected to negative terminal of breadboard and to the last pin of potentiometer.
h. Enable pin of LCD is connected to the pin 11 of arduino.
i. DB4, DB5, DB6 and DB7 of LCD is connected to pin 5,4,3,2 respectively.
j. Place a LED and resistor on the breadboard and connect this one pin of LED to pin13 of arduino.
k. The other pin of LED is connected to negative terminal of breadboard.
l. The temperature sensor first pin is connected to negative terminal of breadboard and last pin is connected to positive terminal of breadboard. The second pin is connected to the input A0 of arduino.
m. A NPN transistor is placed on the breadboard. Ammeter is grounded. Last pin of NPN transistor is connected to DC motor.
n. The last pin of NPN transistor a diode is placed also it is connected to the other pin of DC motor and to the positive terminal of breadboard.
o. A resistor is placed on the positive terminal of breadboard and one of its end is connected to the LCD anode and the other end is connected to cathode.

CODE:

```
const int temp_trans_pin = A0;

const int Heater_pin = 13;

const int FAN_Pin = 6;


// Set the range of the desire temperature


float MinTemp=20, MaxTemp=25; // Room temp [20-25]


#include<LiquidCrystal.h> // library name included
```

```
LiquidCrystal LCD (12, 11, 5, 4, 3, 2);

void setup(){
  LCD.begin(16,2);
  pinMode(Heater_pin,OUTPUT);
  pinMode(FAN_Pin,OUTPUT);

  LCD.print("Room Temp(C): ");
  LCD.setCursor(2,1);
  LCD.print(MinTemp);
  LCD.print("-");
  LCD.print(MaxTemp);

  delay(2000);

}

void loop() {

  float Eqv_volt, SensorTemp;

  Eqv_volt=analogRead(temp_trans_pin)*5.0/1023;
  SensorTemp = 100.0*Eqv_volt-50.0;

  LCD.clear();
  LCD.print("Sensor Reading: ");
```

```
LCD.setCursor(2, 1);
LCD.print(SensorTemp);
LCD.print(" C");

delay(2000);

if (SensorTemp>MaxTemp){
  LCD.clear();
  LCD.print("Temp is HIGHER!");
  LCD.setCursor(0,1);
  LCD.print("Turn on FAN!");

  for(int i=0; i<=255; i++){
    analogWrite(FAN_Pin, i);
    }

  delay(2000);

  LCD.clear();
  LCD.print("Now temp is OK!");
  LCD.setCursor(0,1);
  LCD.print("Turn off FAN!");

  for(int i=255; i>0; i--){
    analogWrite(FAN_Pin, i);
    }
```

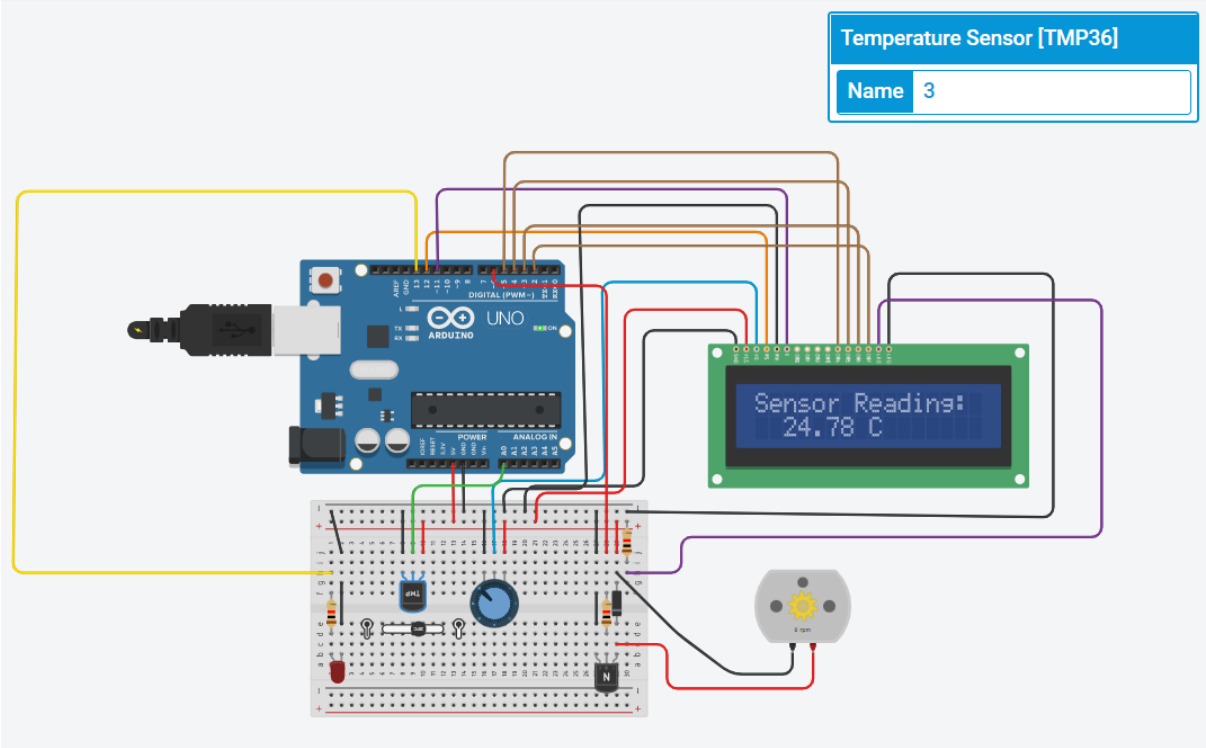
```
   delay(2000);

   }

 else if(SensorTemp<MinTemp){
   LCD.clear();
   LCD.print("Temp is LOWER!");
   LCD.setCursor(0,1);
   LCD.print("Turn on HEATER!");

digitalWrite(Heater_pin, HIGH);

   delay(3000);

   LCD.clear();
   LCD.print("Now temp is OK!");
   LCD.setCursor(0,1);
   LCD.print("Turn off HEATER!");

   delay(1000);

   digitalWrite(Heater_pin, LOW);
   LCD.clear();
 }

 else if(SensorTemp>MinTemp && SensorTemp<MaxTemp){
```

```
  LCD.clear();
  LCD.print("Temp is normal!");
  LCD.setCursor(2,1);
  LCD.print("Turn off all");

  delay(1000);

  LCD.clear();
}

else{

  LCD.clear();
  LCD.print("Something went wrong");
  LCD.setCursor(2,1);
  LCD.print("wrong in the circuit");

  delay(1000);
  LCD.clear();

}

delay(1000);
}
```

Output Screenshots:

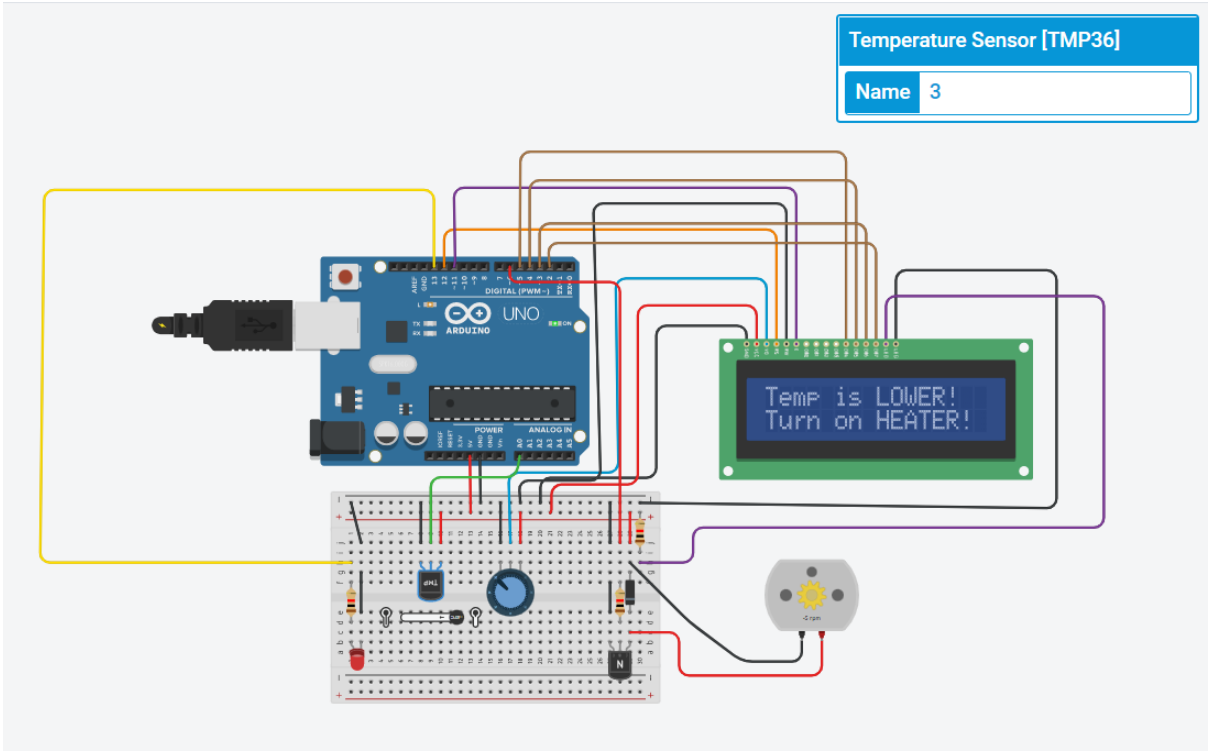
Normal room temperature:

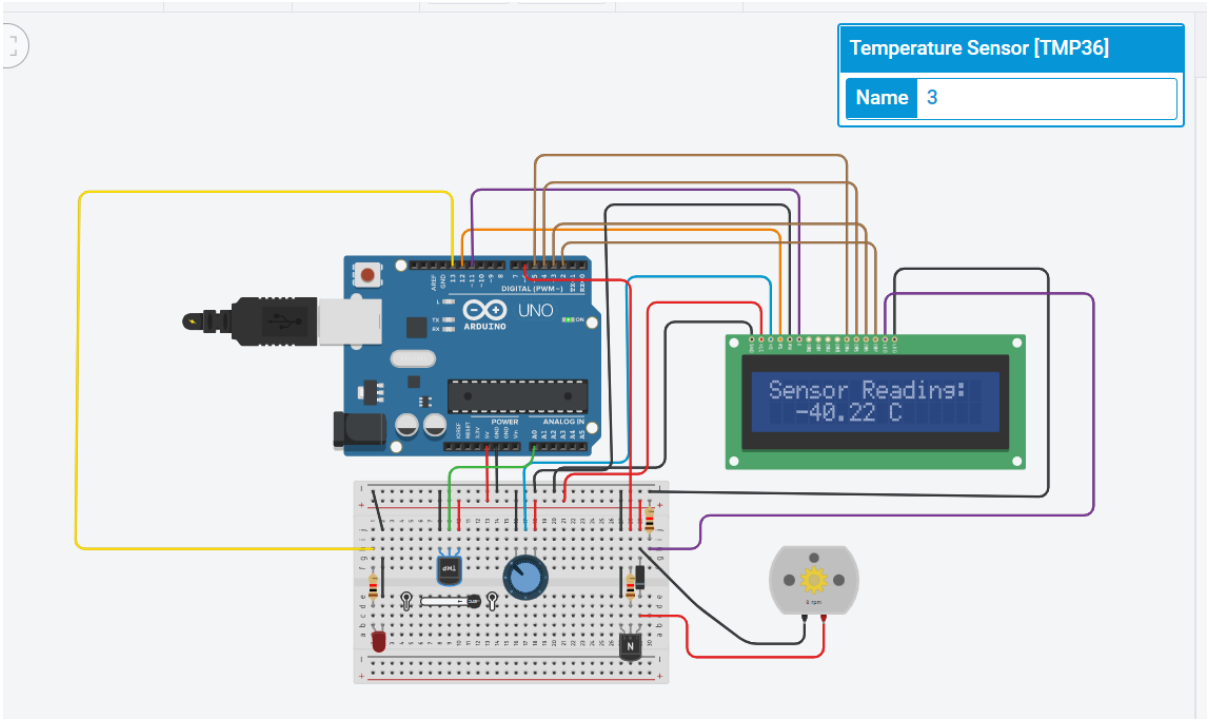
If the temperature is in normal condition then there is no change in the LED and the fan.



Temperature is lower:

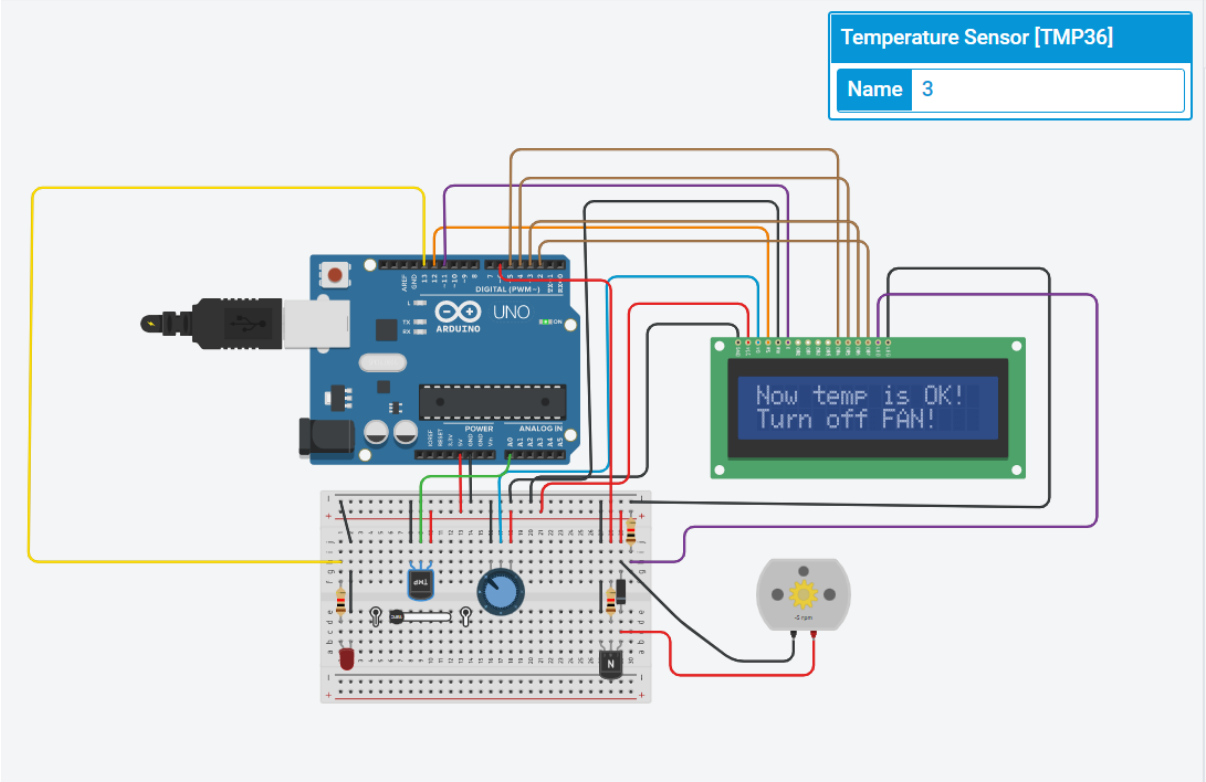
If the temperature is lower then the LED goes ON. Indicates that the heater is ON.

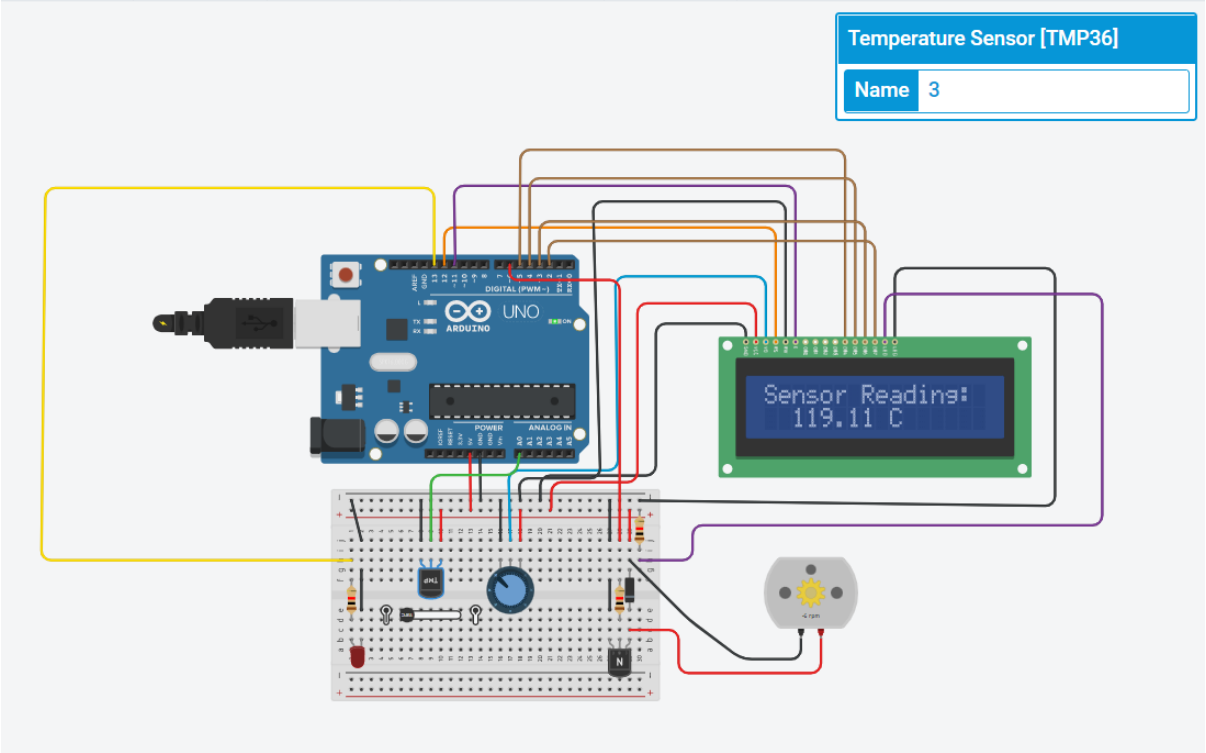




Temperature is higher:

If the temperature is higher then the LED goes off i.e, heater is OFF and the fan starts rotating.





Conclusion:

Hence the automatic room temperature controller is created and implemented successfully by giving different inputs.