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LEROTHOLI POLYTECHNIC

SCHOOL OF ENGINEERING AND TECHNOLOGY

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Program:	**B.ENG.TECH COMPUTER ENGINEERING**
Subject Name:	**Microcontroller Systems 1**
Subject Code:	**MCSY22107**
Assignment Number:	**6**

Due Date:	**2**	**8**	**0**	**4**	**2**	**0**	**2**	**4**

Lecturer:	**Mr. T.P Raliete**

Declaration of own work

I hereby declare that this assignment is my own work and that it has not been copied from any other person or document.

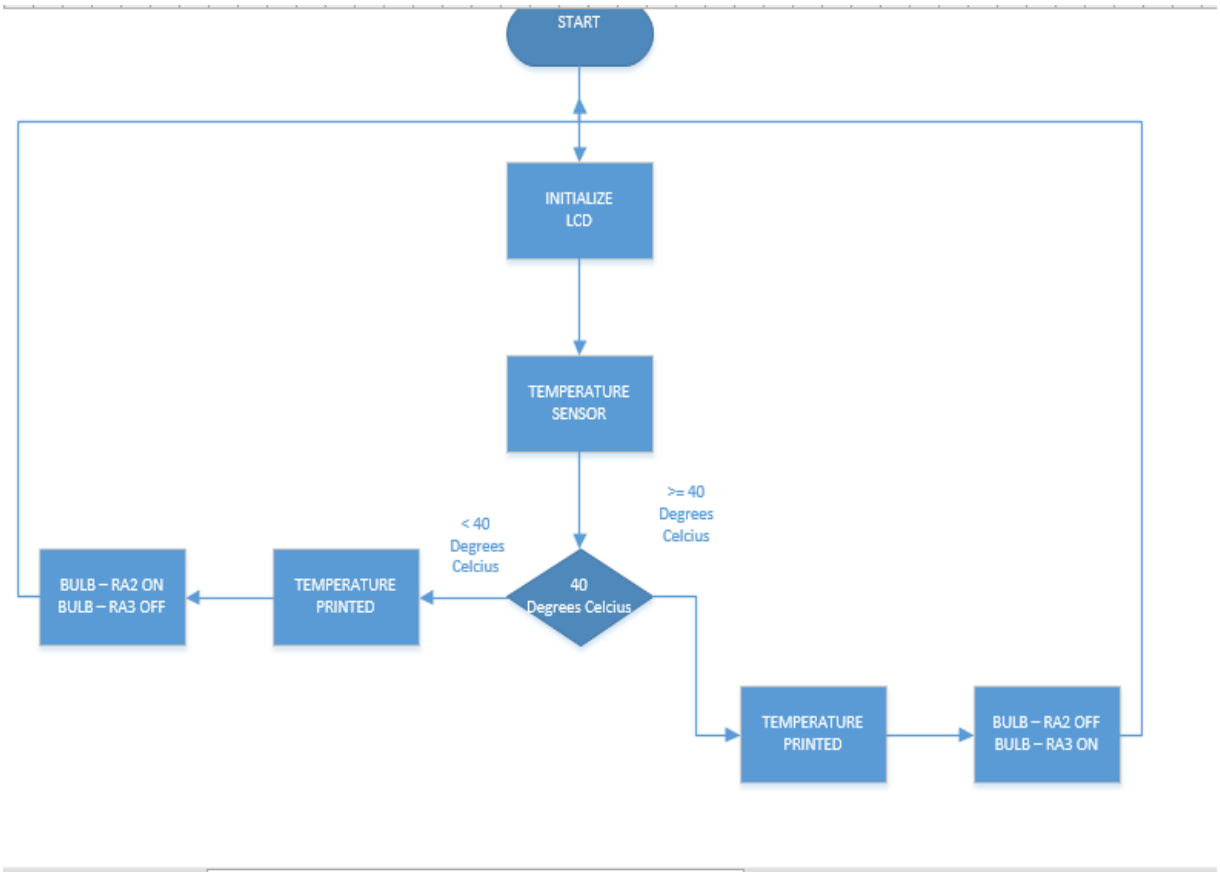
...T.Potloane..... ....28/04/24.....

signature date

TRUTH TABLE

Temperature	Fan (RA2)	Heater(RA3)
< 40	Off	On
>= 40	On	Off

FLOW CHART



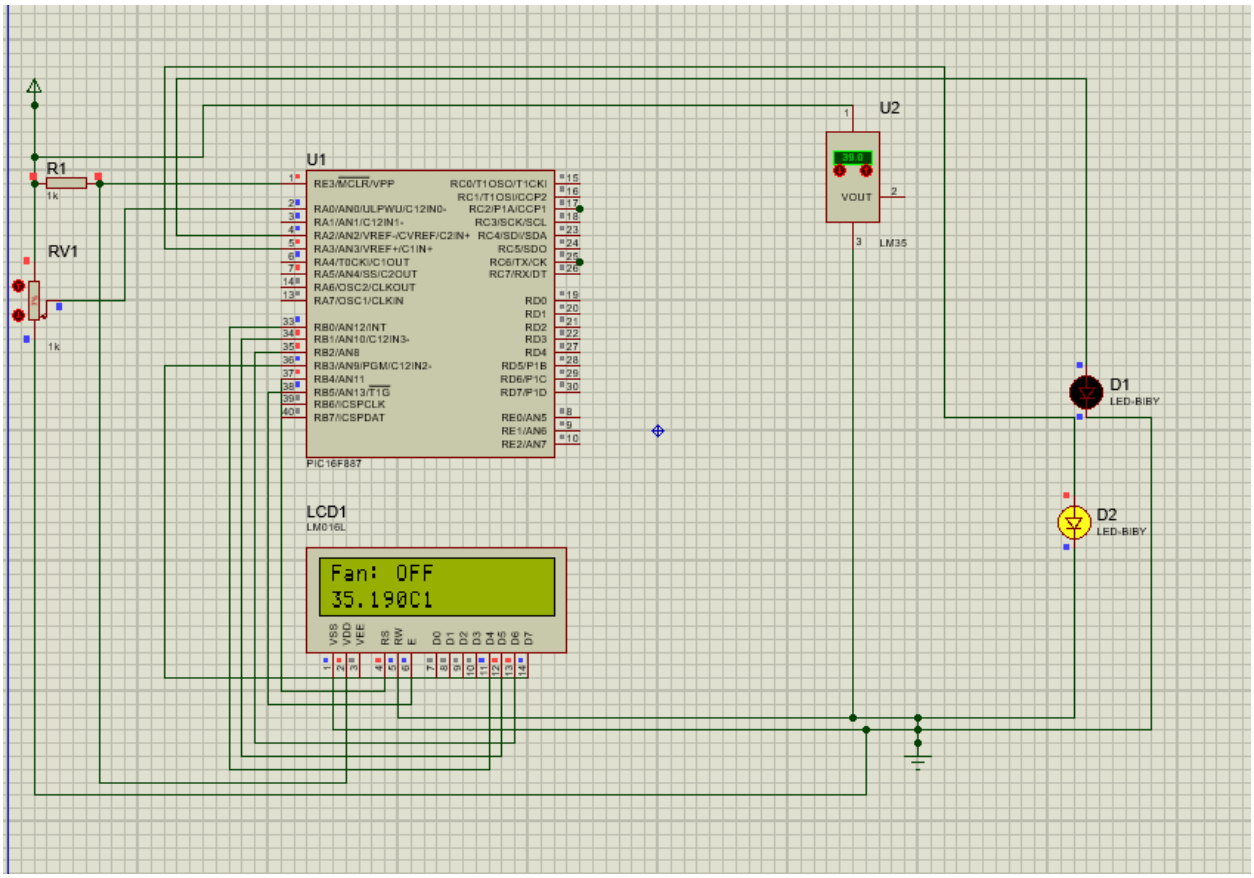
THE CODE

```
sbit LCD_RS at RB4_bit;
sbit LCD_EN at RB5_bit;
sbit LCD_D4 at RB0_bit;
sbit LCD_D5 at RB1_bit;
sbit LCD_D6 at RB2_bit;
sbit LCD_D7 at RB3_bit;

sbit LCD_RS_Direction at TRISB4_bit;
sbit LCD_EN_Direction at TRISB5_bit;
sbit LCD_D4_Direction at TRISB0_bit;
sbit LCD_D5_Direction at TRISB1_bit;
sbit LCD_D6_Direction at TRISB2_bit;
sbit LCD_D7_Direction at TRISB3_bit;

float temperature;
char temp[7];

void main() {
   ANSEL = 0x01; // Configure AN0 pin as analog
   ANSELH = 0x00; // Configure other AN pins as digital
   TRISA = 0b00000001; // Configure PORTA as output (RA0 as input for LM35)
   Lcd_Init(); // Initialize LCD
   ADC_Init(); // Initialize ADC module
   Lcd_Cmd(_LCD_CLEAR); // Clear display
   Lcd_Cmd(_LCD_CURSOR_OFF); // Cursor off
```

```
LCD_OUT(1, 3, "Temperature");
LCD_OUT(2, 3, "Sensor");
delay_ms(2000);
Lcd_Cmd(_LCD_CLEAR);
Lcd_Cmd(_LCD_CURSOR_OFF);

while (1) {
   // Read temperature from the sensor
   temperature = ADC_Read(0); // Read ADC value from AN0 pin
   temperature = temperature * (5.0 / 1023.0) * 100.0;

   // Convert temperature to string for LCD display
   floatToStr(temperature, temp);

   // Display temperature on LCD
   LCD_OUT(2, 1, temp);
   LCD_OUT(2, 7, "C");

   // Check if temperature exceeds 40 degrees Celsius
   if (temperature > 40.0) {
      // Turn on the fan
      PORTA.RA2 = 1;
      LCD_OUT(1, 1, "Fan: ON ");
   } else {
      // Turn off the fan
      PORTA.RA2 = 0;
      LCD_OUT(1, 1, "Fan: OFF");
```

```
        }

        // Check if temperature exceeds 40 degrees Celsius to turn on the heater
        if (temperature > 40.0) {
            // Turn off the heater
            PORTA.RA3 = 0;
        } else {
            // Turn on the heater
            PORTA.RA3 = 1;
        }

        delay_ms(500);
    }
}
```

THE CIRCUIT


U1
PIC16F887
R1
1k
RV1
1k
U2
VOUT
LM35
D1
LED-BIBY
D2
LED-BIBY
LCD1
LM016L
Fan: OFF
35.190C1