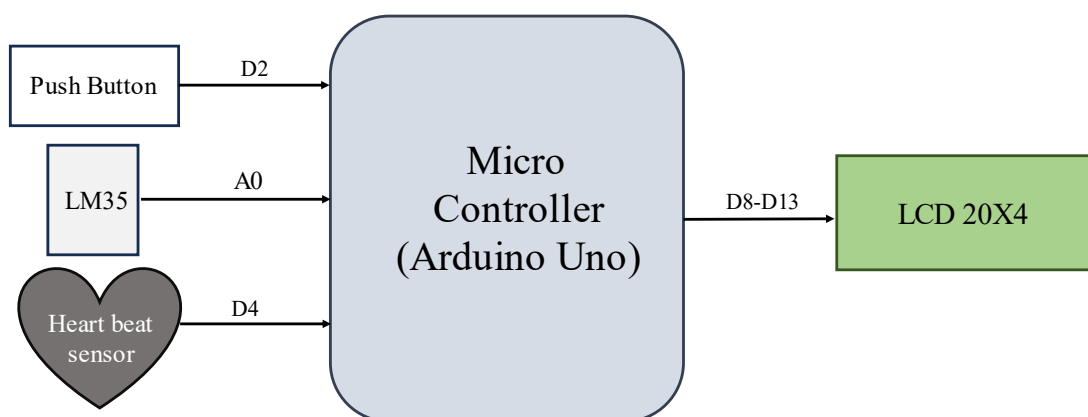


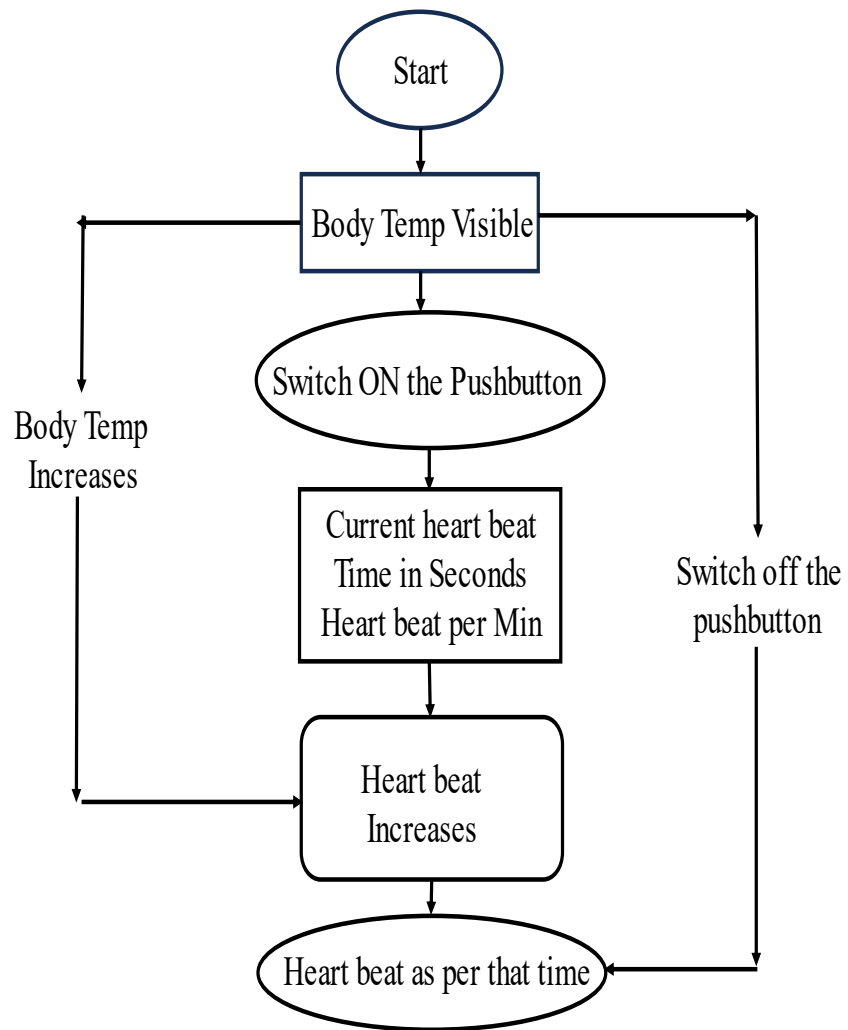
# AUTOMATIC HEART RATE AND BODY TEMPERATURE MONITORING SYSTEM USING ARDUINO

**Description:** The Arduino is interfaced with LM-35 temperature sensor to sense the surrounding temperature and a pulse sensor to read pulse rate. The measured pulse rate and temperature are displayed on a character LCD 20X4 interfaced to the Arduino. Heart rate is the number of heartbeats per unit of time.

## Block Diagram:



## Flow chart:



## Inputs and Outputs:

S.No	Description	Name	Type	Data Direction	Specification	Remarks
1	HB sensor pin	HB1	INP	DI	Digital	Active High
2	Push Button	PB1	INP	DI	Digital	Active High
3	Temp sensor pin	LM35	INP	DI	Digital	Active High
4	LCD EN	EN	OUT	DO	Digital	Active High

5	LCD Data Pin	D4	OUT	DO	Digital	Active High
6	LCD Data Pin	D5	OUT	DO	Digital	Active High
7	LCD Data Pin	D6	OUT	DO	Digital	Active High
8	LCD Data Pin	D7	OUT	DO	Digital	Active High
9	LCD RST	RS	OUT	DO	Digital	Active High

## Source Code:

```
#include <LiquidCrystal.h>
#include <TimerOne.h>
LiquidCrystal lcd(13, 12, 11, 10, 9, 8);

int val;
int tempPin = A0; // temperature Sensor Pin
int HBSensor = 4; // Sensor Pin
int HBCount = 0;
int HBCheck = 0;
int TimeinSec = 0;
int HBperMin = 0;
int HBStart = 2;
int HBStartCheck = 0;

void setup() {
    // put your setup code here, to run once:
    lcd.begin(20, 4);
    pinMode(HBSensor, INPUT);
    pinMode(HBStart, INPUT_PULLUP);
    Timer1.initialize(800000);
    Timer1.attachInterrupt( timerIsr );
    lcd.clear();
    lcd.setCursor(0,0);
    lcd.print("Current HB  : ");
    lcd.setCursor(0,1);
    lcd.print("Time in Sec : ");
    lcd.setCursor(0,2);
    lcd.print("HB per Min  : 0.0");
    lcd.setCursor(0,3);
    lcd.print("Body Temp  : ");
}

void loop() {
```

```

    if(digitalRead(HBStart) == LOW){
        //lcd.setCursor(0,3);
        //lcd.print("HB Counting ..");
        HBStartCheck = 1;}
    if(HBStartCheck == 1)
    {
        if((digitalRead(HBSensor) == HIGH) && (HBCheck == 0))
        {
            HBCount = HBCount + 1;
            HBCheck = 1;
            lcd.setCursor(14,0);
            lcd.print(HBCount);
            lcd.print(" ");
        }
        if((digitalRead(HBSensor) == LOW) && (HBCheck == 1))
        {
            HBCheck = 0;
        }
        if(TimeinSec == 10)
        {
            HBperMin = HBCount * 6;
            HBStartCheck = 0;
            lcd.setCursor(14,2);
            lcd.print(HBperMin);
            lcd.print(" ");
            //lcd.setCursor(0,3);
            //lcd.print("Press Button again.");
            HBCount = 0;
            TimeinSec = 0;
        }
    }
}

```

```

    val = analogRead(tempPin);
    float mv = (val/1024.0)*5000;
    float cel = mv/10;
    lcd.setCursor(14,3);
        lcd.print(cel);
        lcd.print(" ");
        delay(100);
}

```

```

void timerIsr()
{
    if(HBStartCheck == 1)
    {

```

```

    TimeinSec = TimeinSec + 1;
    lcd.setCursor(14,1);
    lcd.print(TimeinSec);
    lcd.print(" ");
  }
}

```

## Schematic:

