# Contactless temperature Screening system

Objective

- To automate contactless temperature screening process.
- To accurately measure body temperature.
- Interfacing display component in order to display various instructions and temperature data.
- To map temperature data with the person information using RFID module.
- Wirelessly communicate data from Arduino to computer.
- Creating a database using excel from the data from RFID and IR temperature sensor.

Flow diagram
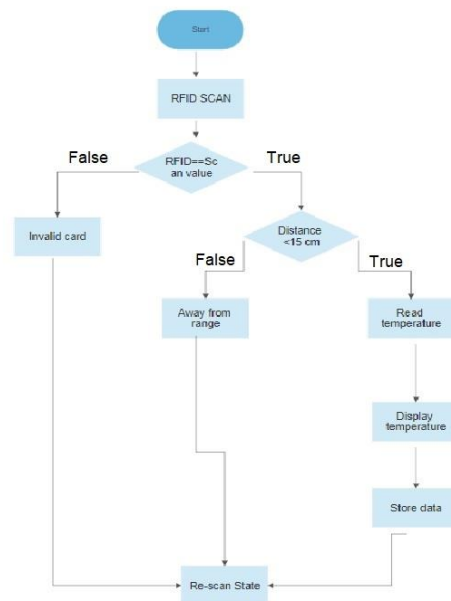
Components

RFID RC 522: - RFID module consists of a reader and a information encoded tag when the tag is in proximity of the reader the encoded information is transferred to the reader using radio frequency waves. RFID follows SPI protocol.

Ultrasonic ranging module HC - SR04: - Ultrasonic ranging module is used to detect the distance of object from the sensor in this project it is used to detect person standing in proximity of temperature sensor.

16*2 LCD display with I2C Interface: - It is used to display the data and it uses I2C serial communication.

Infrared temperature sensor MLX90614: -It is a contact less temperature sensor which detect the temperature variation it follows I2C serial communication

Bluetooth module HC 05: - This module is used to wirelessly communicate data to computer using Bluetooth this module work on 9600 baud rate.
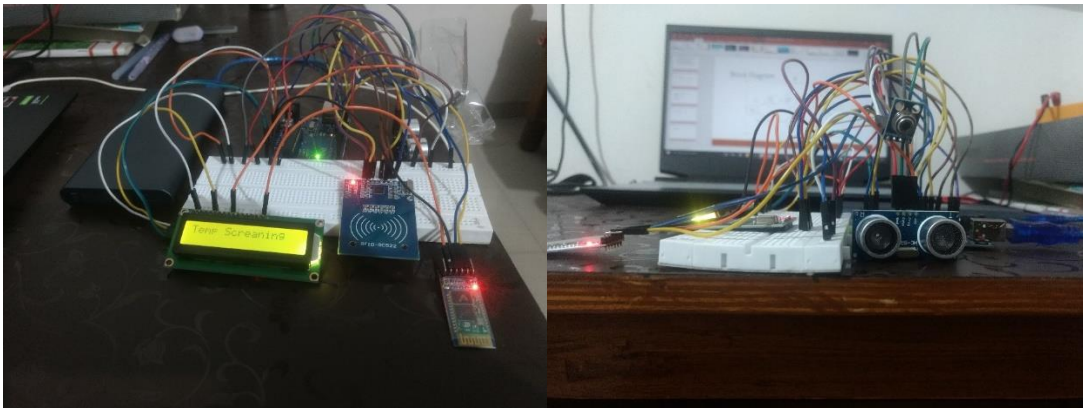
Connections
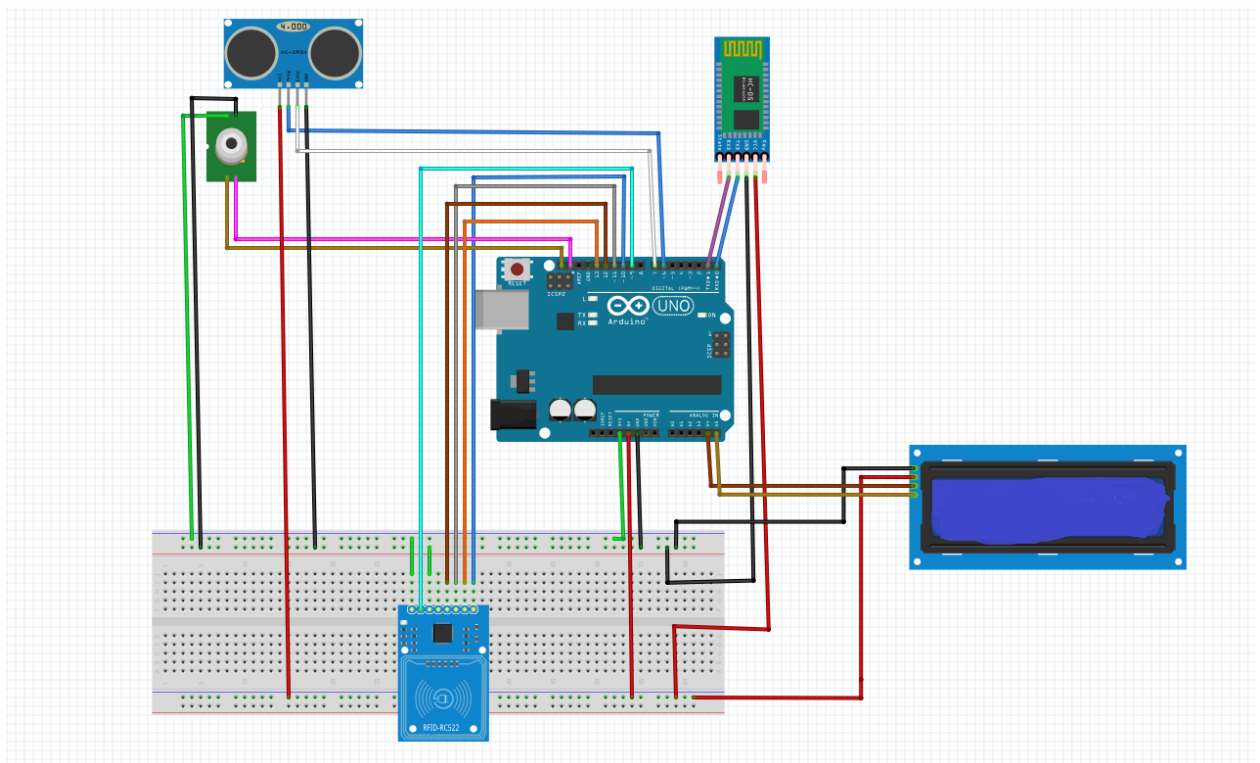
MLX90614	
VCC	3.3V
GND	GND
SCL	SCL
SDA	SDA

16*2 Display	
VCC	5v
GND	GND
SDA	A4
SCL	A5

Bluetooth HC05	
Tx	Rx
Rx	Tx
VCC	5V
GND	GND

RFID RC 522	
SDA	10
SCK	13
MOSI	11
MISO	12
GND	GND
RESET	9
VCC	3.3V

DISTANCE HC - SR04	
VCC	5V
TRIG	6
ECHO	7
GND	GND

Working

RFID RC 522 module is connected to the Arduino and follows SPI protocol to communicate with Arduino as soon as the card is scanned on the rfid module and if the card is verified then further process of temperature measurement takes place otherwise Invalid card is displayed on the 16*2 display in which a I2C module is connected in which serial communication is used to transfer data from Arduino to display. Ultrasonic distance sensor is used to detect the proximity of the user from the temperature sensor if the distance is greater than 15 cm then an error statement is displayed on the display and then the user again has to scan the card and if the user is within 15 cm them infrared temperature sensor measure temperature value and communicate value of temperature along with user name to computer using Bluetooth module and then this data is stored to Excel file using PLX extension for excel.

Program

```
#include <SPI.h>
#include <MFRC522.h>
#include <Wire.h>
#include <Adafruit_MLX90614.h>
#include <LiquidCrystal_I2C.h>

Adafruit_MLX90614 mlx = Adafruit_MLX90614();
#define SS_PIN 10 //RFID
#define RST_PIN 9 //RFID
#define trigPin 6 //Distance sensor
#define echoPin 7 //Distance Sensor
float duration, distance;
float tmp;

LiquidCrystal_I2C lcd(0x27,16,2);
MFRC522 mfrc522(SS_PIN, RST_PIN);

void setup()
{
  Serial.begin(9600);   // Initiate a serial communication
  SPI.begin();          // Initiate  SPI bus
  pinMode(trigPin, OUTPUT);
  pinMode(echoPin, INPUT);
  Wire.begin();
  lcd.begin();
  lcd.backlight();
  lcd.print("Temp Screaning");
  lcd.setCursor(0,1);
  lcd.print("Scan Card.");
  delay(1000);
  clearCharacters(1,0,15);
  Serial.println("CLEARDATA");
  Serial.println("LABEL,Time,Name,Temperature");

}
void loop()
{
  if ( ! mfrc522.PICC_IsNewCardPresent())
  {
    return;
  }
```

```cpp
 if ( ! mfrc522.PICC_ReadCardSerial())
 {
   return;
 }
 String content= "";
 for (byte i = 0; i < mfrc522.uid.size; i++)
 {
    content.concat(String(mfrc522.uid.uidByte[i] < 0x10 ? " 0" : " "));
    content.concat(String(mfrc522.uid.uidByte[i], HEX));
 }
 content.toUpperCase();

 if (content.substring(1) == "69 1A FA A2")
 { delay(5000);
   temp();
   Serial.print("DATA,TIME,Shubham,");
   Serial.println(tmp);
 }else if (content.substring(1) == "14 59 C8 40")
 {delay(5000);
    temp();
    Serial.print("DATA,TIME,Abhijeet,");
    Serial.println(tmp);
 } else if (content.substring(1) == "26 54 B4 25")
 {delay(5000);
    temp();
    Serial.print("DATA,TIME,Rajdeep,");
    Serial.println(tmp);
 } else{
   clearCharacters(1,0,15);
   lcd.setCursor(0,1);
   lcd.print("Card Not Verfid");
   delay(5000);
   clearCharacters(1,0,15);
   lcd.setCursor(0,1);
   lcd.print("Rescan");
   delay(5000);
   clearCharacters(1,0,15);

  }
}

void temp()
{
  digitalWrite(trigPin, LOW);
```

```
  delayMicroseconds(2);
 digitalWrite(trigPin, HIGH);
 delayMicroseconds(10);
 digitalWrite(trigPin, LOW);

 duration = pulseIn(echoPin, HIGH);

 distance = (duration / 2) * 0.0343;

 if (distance <= 15) {
      clearCharacters(1,0,15);
      tmp=mlx.readObjectTempC();
      lcd.setCursor(0,1);
      lcd.print("TEMP");
      lcd.print(" ");
      lcd.print(tmp);
      lcd.print(" ");
      lcd.print("C");
      delay(5000);
      clearCharacters(1,0,15);


  }
  else {
   clearCharacters(1,0,15);
      lcd.setCursor(0,1);
      lcd.print("Away ReScan Cad");
      delay(5000);
      clearCharacters(1,0,15);

  }
  delay(500);
}
void clearCharacters(int row,int start,int stop )
{
  for (int i=start; i<=stop; i++)
  {
  lcd.setCursor (i,row); //
  lcd.write(254);
  }

}
```
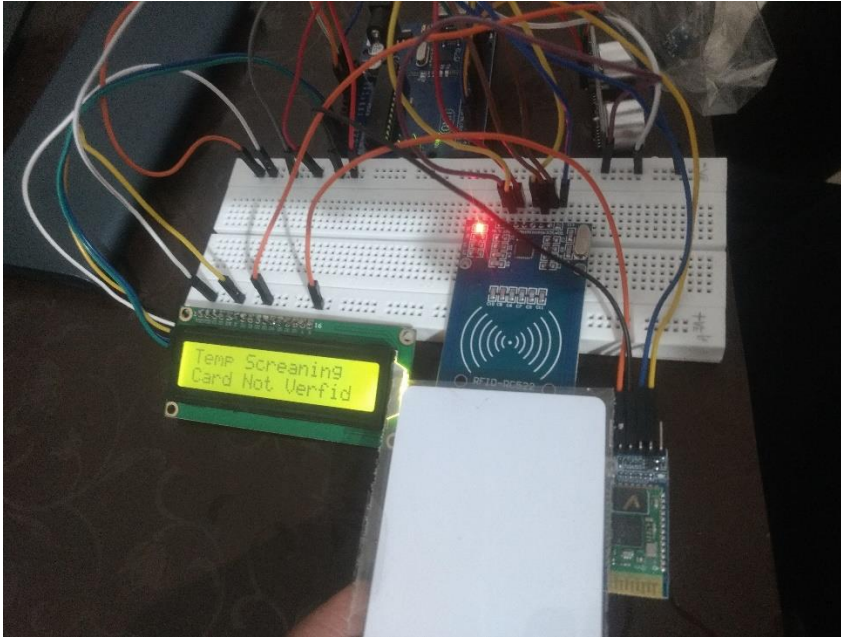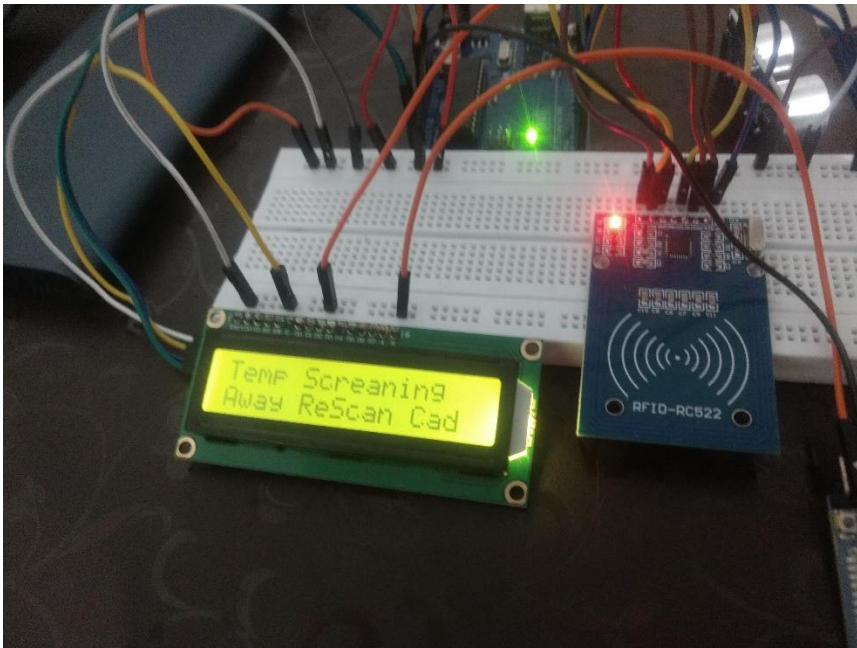
Testing

Condition 1 Unverified card is scanned

Condition 2 Verified card is scanned but away from temperature sensor

Condition 3 Verified card