FACULTY OF COMPUTING and ARTIFICIAL INTELLIGENCE
MEDICAL INFORMATICS DEPARTMENT

HELWAN UUNIVERSITY

PROJECT OF BIO-ANALYSIS

IN

COVID-19 Detector

PREPARED BY

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Under Supervision:

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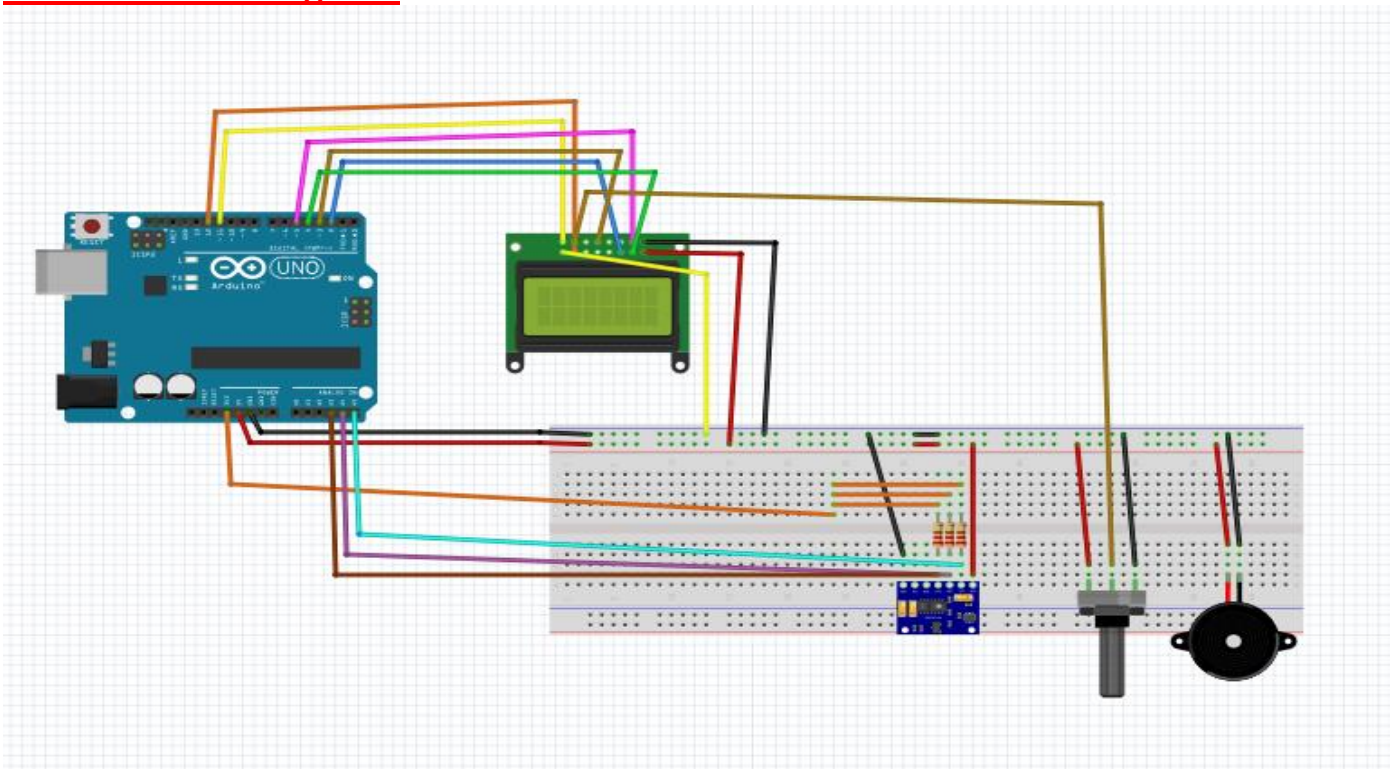
- **Project Name :-**
  COVID-19 Detector

- **Components :-**
  Arduino uno
  16 * 2 LCD
  MAX30100 Pulse Oximeter
  Jumpers
  Breadboard
  3 Resistors 4.7k
  Buzzer

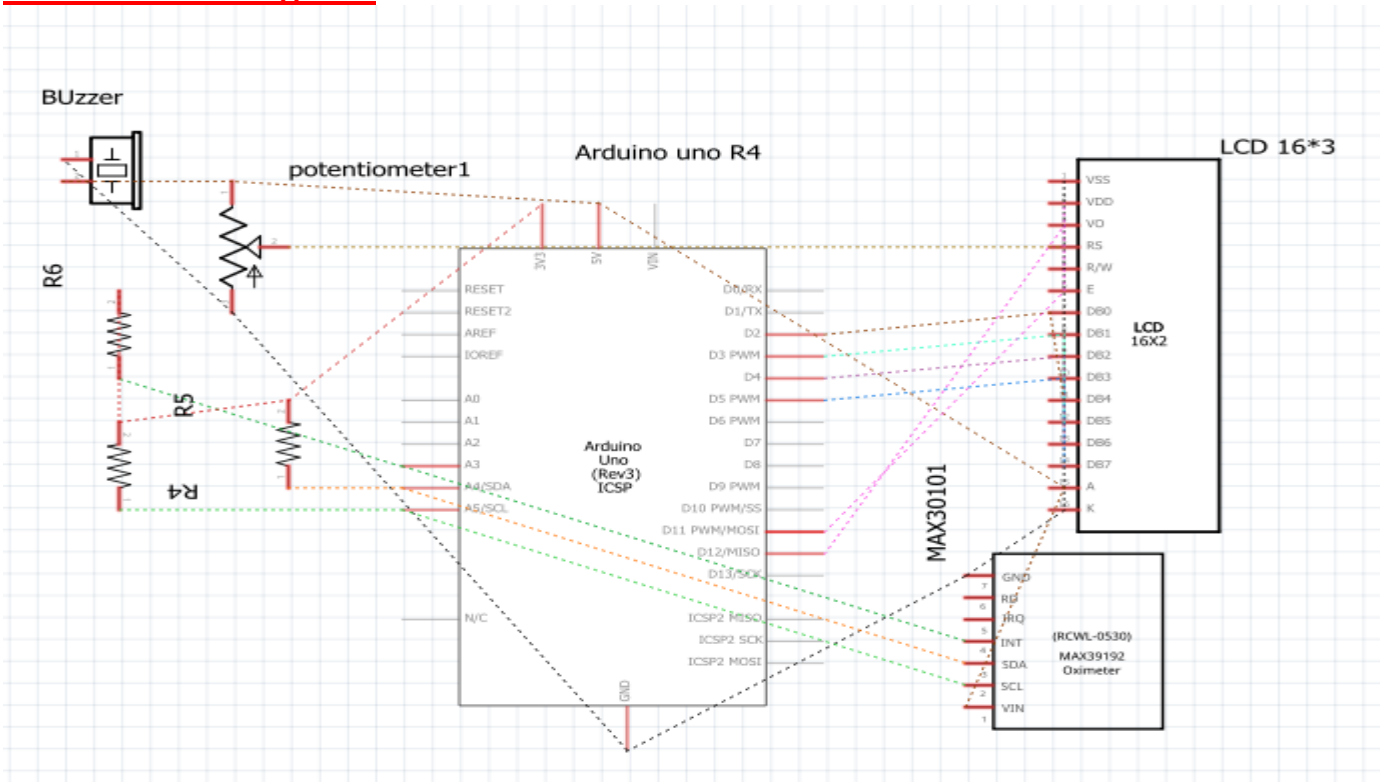
- **project objectives and its effect on medical field :-**
  This project aims to help combat the emerging corona virus epidemic by means of discovering the symptoms of this disease, and the most important of these symptoms are low oxygen level in the blood, and palpitations in the patient's heartbeat.
  The patient can measure these things by simply touching the sensor with his finger, and the LCD screen will display the values of oxygen level in the blood, and heart rates.
  in condition of the oxygen saturation in the blood less than 95% which is the normal range , and the heart rates is more than the normal range which is 60-99 BPM , we suppose that person is coronavirus suspected.
  And by that, we reduce the burden on the medical staff to check these vital functions for every person suspected of having Corona , in addition it is low cost for any person.

- **Circuit Diagram :-**

Breadboard Diagram



Schematic Diagram



- **The Project Code :-**

```
#include <CircularBuffer.h>
#include <MAX30100.h>
#include <MAX30100_BeatDetector.h>
#include <MAX30100_Filters.h>
#include <MAX30100_PulseOximeter.h>
#include <MAX30100_Registers.h>
#include <MAX30100_SpO2Calculator.h>
#include <LiquidCrystal_I2C.h>
#include <Wire.h>
#include <LiquidCrystal.h>
#include "MAX30100_PulseOximeter.h"

LiquidCrystal lcd(12, 11, 5, 4, 3, 2);

#define REPORTING_PERIOD_MS     1000
int c = 0, m = 0;

PulseOximeter pox;
uint32_t tsLastReport = 0;

void onBeatDetected()
{
  Serial.println("Beat!");
}


void setup()
{

  lcd.begin(16, 2);
  lcd.print("Initializing...");
  delay(10);


  delay(3000);
  lcd.clear();

  pox.setIRLedCurrent(MAX30100_LED_CURR_24MA);


  pox.setOnBeatDetectedCallback(onBeatDetected);


}

void loop()
{
  pox.update();
  if (millis() - tsLastReport > REPORTING_PERIOD_MS) {


    lcd.clear();
    lcd.setCursor(0, 0);
    lcd.print("Heart rate:");
    double heart = pox.getHeartRate();

    lcd.print(heart);
    lcd.setCursor(0, 1);
    lcd.print("bpm / SpO2:");
```

```
    double o = pox.getSpO2();
    lcd.print(o);
    lcd.println("%");
    m++;

    if (heart > 100 && o < 93 ) {
      c++;
    }
    tone(6, 2000, 200);
    tsLastReport = millis();
  }


  if (m == 12 && (c == 6)) {
    lcd.clear();
    lcd.setCursor(0, 0);
    lcd.print("COVID-19: Suspected");
    tone(6, 7000, 200);
    delay (3000);
    lcd.clear();
    lcd.setCursor(0, 0);
    c = 0; m = 0;
  }
  else if (m == 12) {
    lcd.clear();
    lcd.setCursor(0, 0);
    lcd.print("You are fine");
    delay(3000);
    lcd.clear();
    lcd.setCursor(0, 0);
    c = 0; m = 0;
  }


       }
```