HEALTH MONITORING SYSTEM

PROJECT REPORT

Submitted by

Jumana Begum J – 2019103022

Karthika T – 2019103026

CS6014 - IOT AND SMART APPLIANCES

ANNA UNIVERSITY :: CHENNAI 600 025

ABSTRACT :

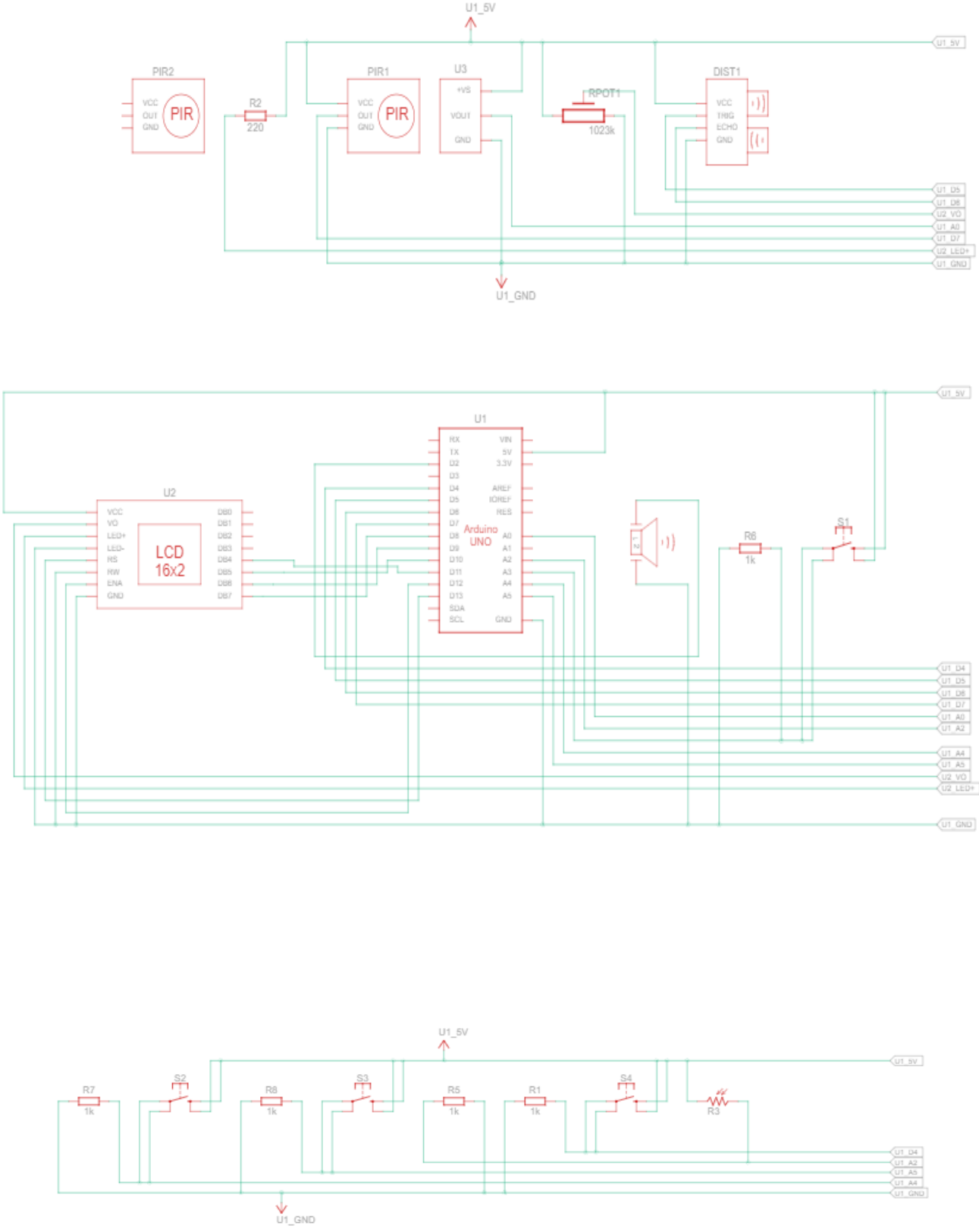
The project presents a “IoT based Health Monitoring system” that uses biomedical sensors to check a patient's health status. It incorporates the use of sensors to measure parameters like human body temperature, pulse rate and distance. If the recorded value is abnormal according to the code parameters, it alerts the user using a buzzer and shows the result on the LCD display to notify the user. The biomedical sensors here are connected to an Arduino UNO controller to read the data which is in turn interfaced to an LCD display/serial monitor to show the output. In addtion to that it measures the body-mass index of the patient through the values entered in serial monitor and serves as a medicine reminder. This is very useful for self-health analysis.

INTRODUCTION :

The term IoT, or Internet of Things, refers to the collective network of connected devices and the technology that facilitates communication between devices and the cloud, as well as between the devices themselves. IoT plays a pivotal role in the field of Medicine and Health.

Telemedicine based intelligent systems provide high-quality healthcare monitoring, which saves on medical and manpower costs. As new technologies arises, computer-based portable embedded devices allow people to perform daily routine checkups under non-clinical environments. However, such health management can only be achieved if these computer-based portable monitoring devices with smart sensor technologies are available. Hence, we have come up with a prototype of a portable smart health monitoring system that can be used by people both indoors and outdoors. In our work, different biomedical sensors like temperature, pulse, PIR and ultrasonic distance sensor- are interfaced with Arduino UNO microcontroller to get the reading from sensors. It includes pushbuttons providing the user to choose what task to do according to their need and it also encompasses a buzzer and LCD board so as to alert the user with the information regarding the task done.The project aims at executing 4 different tasks by using a single Arduino UNO board and other required sensors. The end product was created so that it is user-friendly.

ARCHITECTURE DIAGRAM :



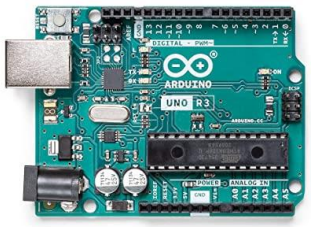
PROJECT MODULES :

Here in this system we have used,

1. Arduino UNO
2. Temperature sensor
3. PIR sensor
4. Ultrasonic distance sensor
5. LCD display
6. Breadboard small
7. Piezo
8. Photoresistor
9. Resistor
10. Pushbutton
11. Potentiometer

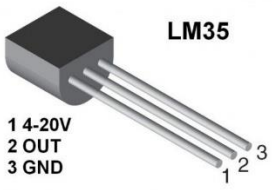
ARDUINO UNO :

Arduino is an open-source platform used for building electronics projects. Arduino consists of both a physical programmable circuit board (often referred to as a microcontroller) and a piece of software, or IDE (Integrated Development Environment) that runs on computer, used to write and upload computer code to the physical board.



TEMPERATURE SENSOR :

A temperature sensor is a device that detects and measures hotness and coolness and converts it into an electrical signal.

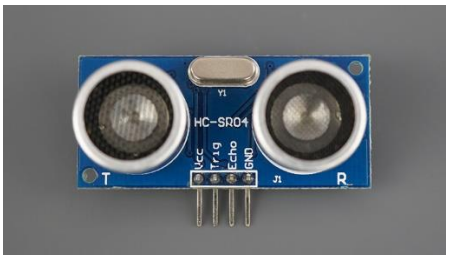


PIR SENSOR :

A passive infrared (PIR) sensor recognizes infrared light emitted from nearby objects.

ULTRASONIC DISTANCE SENSOR :

As the name indicates, ultrasonic sensors measure distance by using ultrasonic waves. The sensor head emits an ultrasonic wave and receives the wave reflected back from the target. Ultrasonic Sensors measure the distance to the target by measuring the time between the emission and reception.



PHOTORESISTOR :

A photoresistor or photocell is a light-controlled variable resistor. The resistance of a photoresistor decreases with increasing incident light intensity. A photoresistor can be applied in light-sensitive detector circuits, and light- and dark-activated switching circuits.

LCD display :

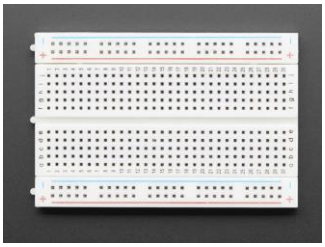
Displaying unit used is 16x2 LCD. It means that there are two rows in which 16 characters can be displayed per line, and each character takes 5X7 matrix space on LCD.

PIEZO :

Piezoelectric sensors have two output pins one is positive potential and other is at negative potential means ground. Positive potential pin connected with pin 3 analog channel of Arduino and negative potential pin connected to ground. A resistor of 2 mega ohm connected between them for protection purpose.

BREADBOARD SMALL :

A breadboard is a solderless construction base used for developing an electronic circuit and wiring for projects with microcontroller boards like Arduino.



RESISTOR :

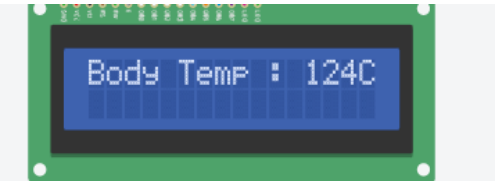
A resistor is an electrical component that limits or regulates the flow of electrical current in an electronic circuit. Resistors can also be used to provide a specific voltage for an active device such as a transistor.

PUSHBUTTON :

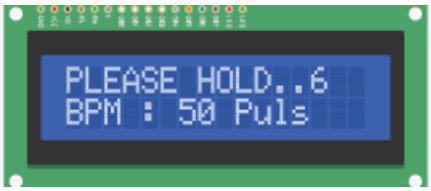
Push buttons allow us to power the circuit or make any particular connection only when we press the button. Simply, it makes the circuit connected when pressed and breaks when released.

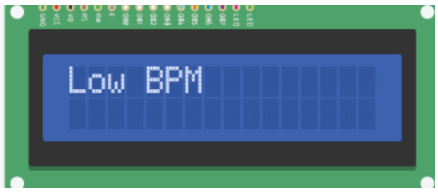
RESULT :

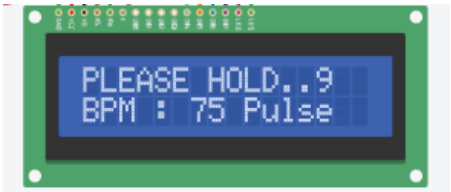
TEMPERATURE :

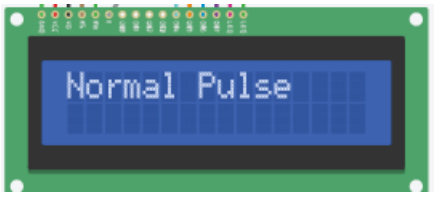


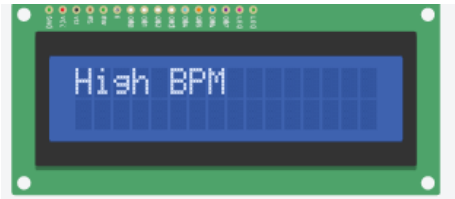
PULSE :

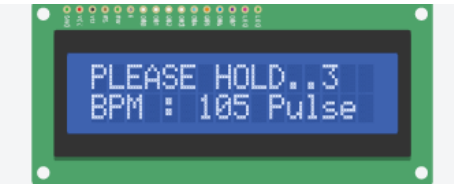




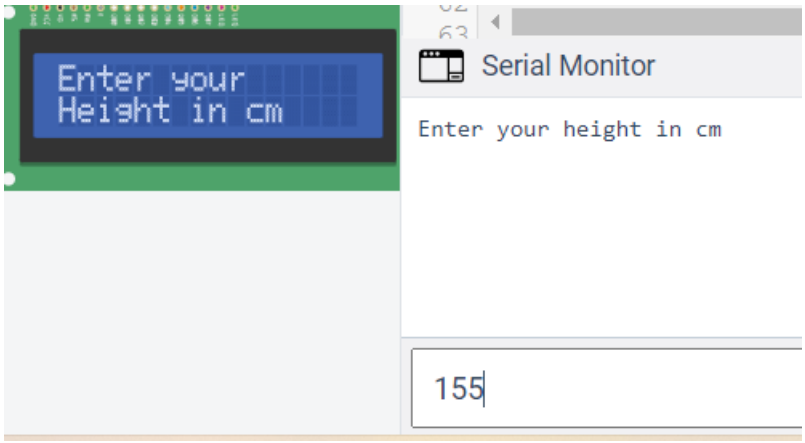


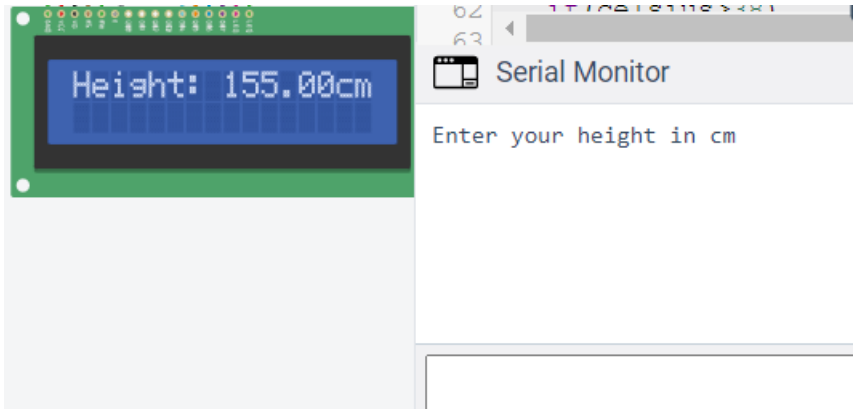


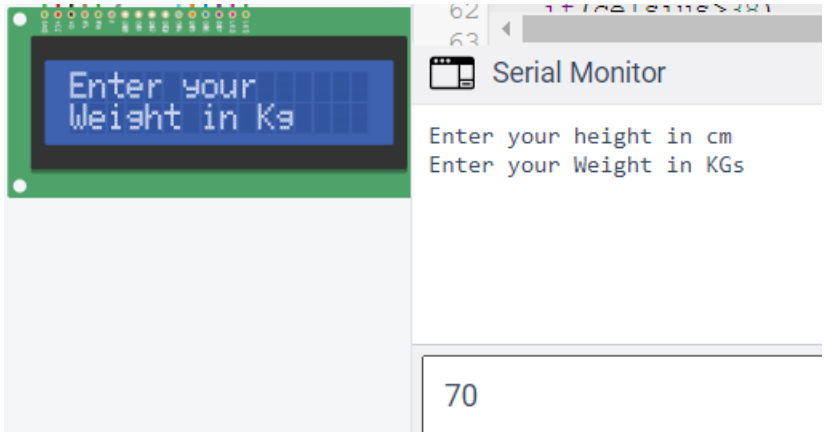


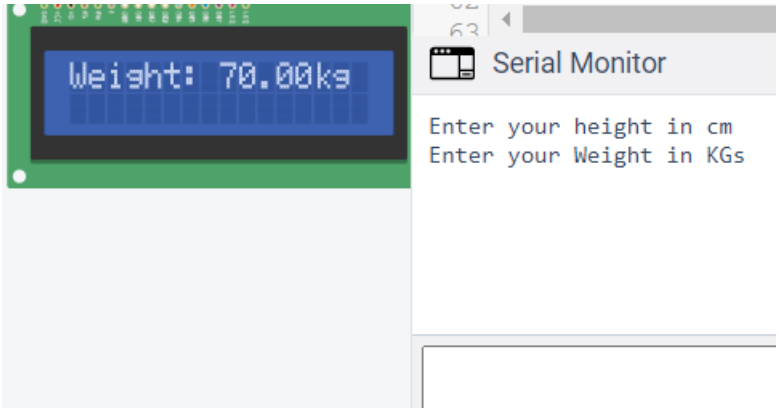


BMI:

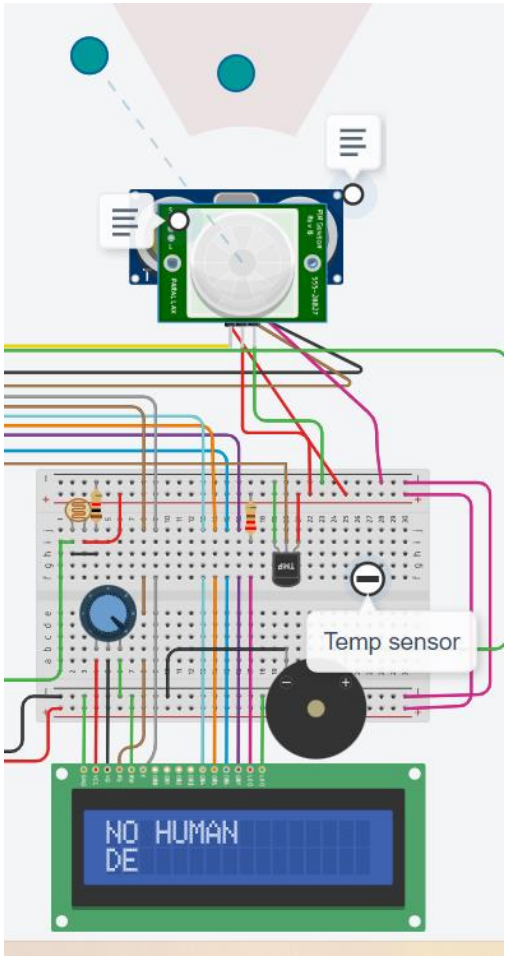

Enter your
Height in cm
Serial Monitor
Enter your height in cm
155

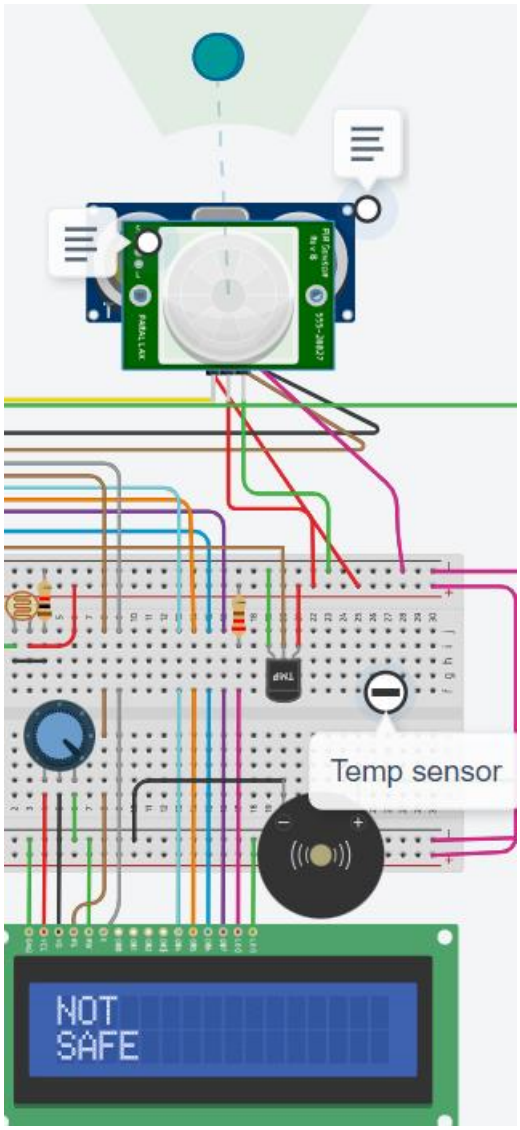

Height: 155.00cm
Serial Monitor
Enter your height in cm

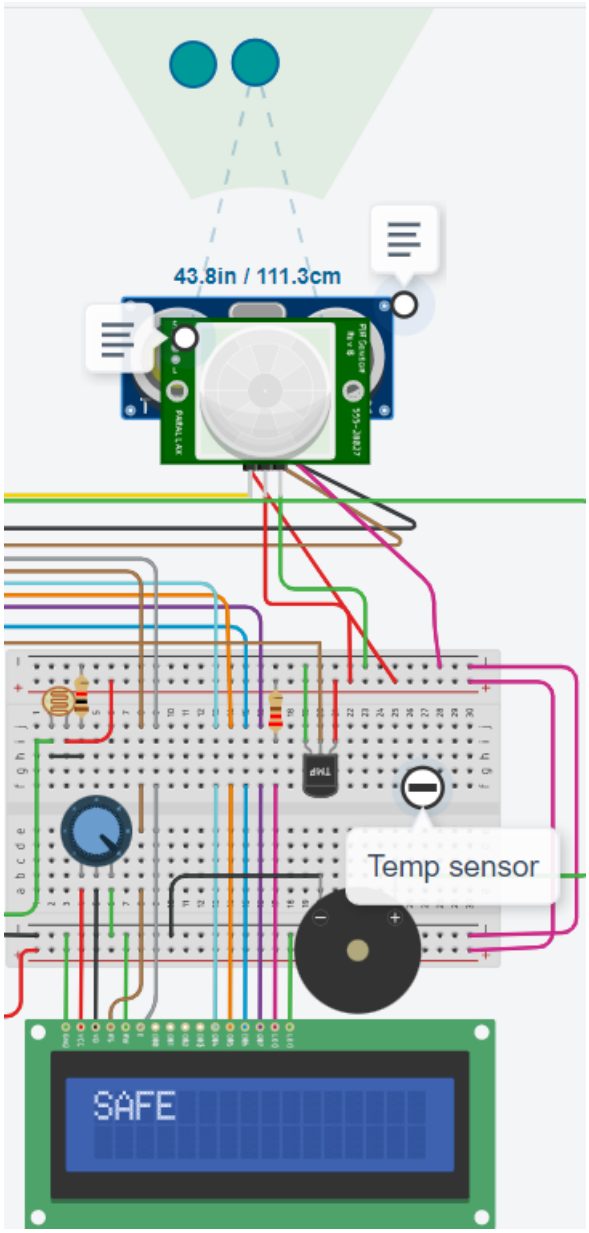

Enter your
Weight in Kg
Serial Monitor
Enter your height in cm
Enter your Weight in KGs
70



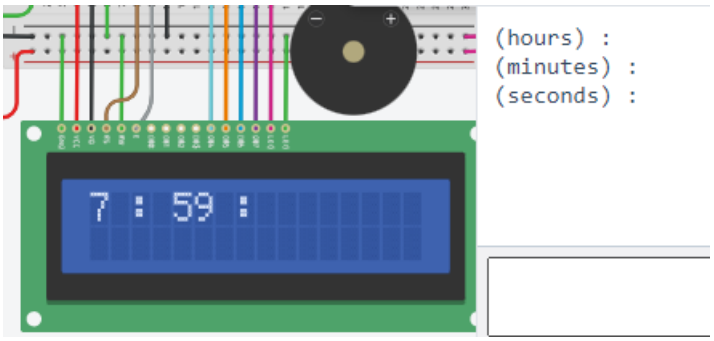
SOCIAL DISTANCING ALERT:

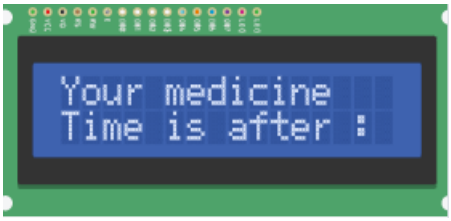


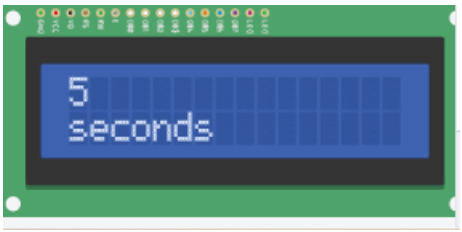

Temp sensor
NOT
SAFE

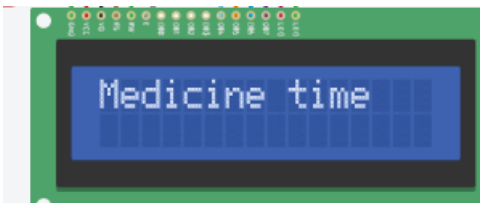

43.8in / 111.3cm
Temp sensor
SAFE

MEDICINE REMINDER:









CONCLUSION :

Thus we have developed a health monitoring system that could perform multiples tasks using an Arduino Board and other required sensors. Simple push buttons are used in order to accomplish these tasks one at a time.

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[1] Mohamed Abdel-Basset Abdo, “Structural Health Monitoring, History, Applications and Future. A Review Book,” Edition First, ISBN 978-1-941926-07-9, January 2014 with 5,205 Reads. Online Available:https://www.researchgate.net/publication/266854280_Structural_Health_Monitoring_History_Applications_and_Future_A_Revi ew_Book

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