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S. G. BALEKUNDRI INSTITUTE OF TECHNOLOGY

Shivabasavanagar, Belagavi- 590 010, Karnataka- India

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Department of Computer Science & Engineering

HOBBY PROJECT

"COVID-19 SAFETY ENTRY/EXIT WITH ATTENDANCE SYSTEM"

Under the guidance of:

Prof. Shaheen Mujawar

Department of Computer Science & Engineering

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CERTIFICATE

Certified that the Project Work entitled **"COVID-19 SAFETY ENTRY/ EXIT WITH ATTENDANCE SYSTEM"** is a bonafide work carried out by **Mr. Sayojya Patil (2BU19CS023), Mr. Sudarshan Hundre (2BU19CS047), Mr. Vinayak Kamble (2BU19CS055), Mr. Vishant Patil (2BU19CS056), Mr. Umar Jamadar (2BU19CS054)** in partial fulfilment for the award of Degree of Bachelor of Engineering in Computer Science and Engineering of the Visvesvaraya Technological University, Belagavi, during the year 2020- 2021. The Project report has been approved as it satisfies the academic requirements in respect of Project work prescribed for the said Bachelor of Engineering Degree.

Signature of Guide

Prof. Shaheen Mujawar

Signature of HOD

Dr. B.S.Halakarnimath

Signature of Principal

Dr. B.R.Patagundi

ABSTRACT

In this bizarre conditions because of the wide spread of Coronavirus infection, it has gotten compulsory to continue cleaning hands and checking temperature while entering shops, eateries, schools/school premises, workplaces, etc to forestall the spread of the infection. Incessant temperature checking and purifying necessities work and the work incharge of the checking go under high danger as he/she interacts with numerous individuals on regular routine.

This undertaking is configuration to mechanize the cycle of temperature checking and sanitiser apportioning at the section of a premises.This framework will be introduced at the passage of the premises where when an individual ready to enter the premises should filter his/her id card and afterward his/her constant temperature with time stamp will be put away in the Database created. And on the off chance that his/her temperature is right as indicated by the Covid-19 standards the entryways of the premises will naturally open for that person.The sanitiser administering machine will apportion sanitiser consequently at whatever point the individual's hand is under the distributor and the individual need not touch the container.

ACKNOWLEDGEMENT

It is our proud privilege and duty to acknowledge the kind help and guidance received from several people in preparation of this Hobby Project Report. It would not have been possible to prepare this report in this form without their valuable help, cooperation and guidance.

First and the foremost, we wish to record our sincere gratitude to Management of this college and to our beloved Professor, Dr.B.R.Patagundi, Principal, S. G. Balekundri Institute of Technology, Belagavi for his constant support and encouragement in preparation of this report and for making available library and laboratory facilities needed to prepare this report.

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We express our sincere gratitude to our beloved guide, Prof. Sheen Mujawar, Professor, Department of Computer Science and Engineering S.G.B.I.T., Belagavi for guiding us throughout this project. Our numerous discussions with her were extremely helpful. We hold her in esteem for guidance, encouragement and inspiration received from him/her.

We would also like to extend my heartfelt gratitude to entire Department of Computer Science and Engineering, S.G.B.I.T, Belagavi, for their continuous support throughout the project which would otherwise be impossible.

Belagavi

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INTRODUCTION

In this uncertain conditions because of the wide spread of Coronavirus infection, it has gotten compulsory to continue cleaning hands and checking temperature while entering shops, eateries, school/college premises, workplaces, etc to forestall the spread of the infection. Due to Incessant temperature checking and purifying necessities work, the work incharge of the checking under go high danger as he/she interacts with numerous individuals on regular routine.

The general venture degree is to guarantee wellbeing of people in this unsure conditions and to improve security at a spot. This system will be made utilizing joined information on hardware and software engineering. By introducing this system, an association can monitor sick individuals entering the premises which will be helpful to forestall spread of the coronavirus infection.

This undertaking is configuration to mechanize the cycle of temperature checking and sanitiser apportioning at the section of a premises.This framework will be introduced at the passage of the premises where when an individual ready to enter the premises should filter his/her id card and afterward his/her constant temperature with time stamp will be put away in the Database created. And on the off chance that his/her temperature is right as indicated by the Covid-19 standards the entryways of the premises will naturally open for that person.The sanitiser administering machine will apportion sanitiser consequently at whatever point the individual's hand is under the distributor and the individual need not touch the container.

OBJECTIVE

The objective of this project is to guarantee wellbeing of people in this unsure conditions and to improve security at a spot. By introducing this system, an association can monitor sick individuals entering the premises which will be helpful to forestall spread of the coronavirus infection.

This system will help an association to take the attendance of the individuals entering the premises on a particular day and store the details of the same.

EXISTING SYSTEM

The old arrangement of Coronavirus security checking needs a man on the job continuously to check temperature of people entering the premises and for allotting sanitizer. This framework isn't ok for both the man on the job and the individual entering the premises as various people interact with the man incharge on an every day schedule. This current framework requires standard wellbeing types of gear like PPE kits and there is a need to supplant this PPE units ideal and arrange them securely.

PROPOSED SYSTEM

This undertaking is configuration to mechanize the cycle of temperature checking and sanitiser apportioning at the section of a premises. This framework will be introduced at the passage of the premises where when an individual ready to enter the premises should filter his/her id card and afterward his/her constant temperature with time stamp and a image will be put away in the Realtime Database created (We have used Firebase Database as the database). And on the off chance that his/her temperature is right as indicated by the Covid-19 standards (< 38°C) the entryways of the premises will naturally open for that person. The sanitiser administering machine will apportion sanitiser consequently at whatever point the individual's hand is under the distributor and the individual need not touch the container.

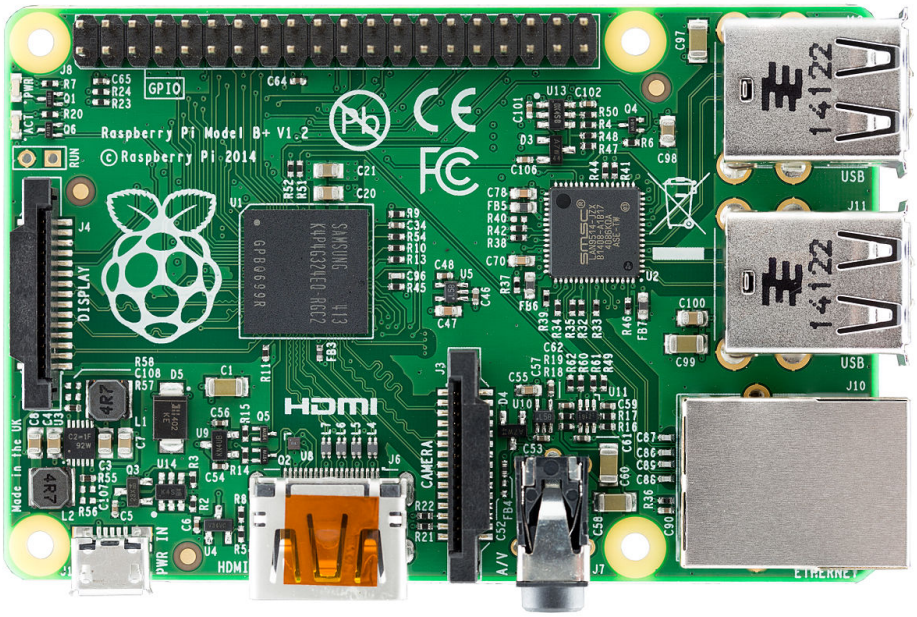
There is an application created in Android Studio using Java as the programming language to retrieve the data from the database.

The admin monitoring the attendance of individuals can access the realtime database with the application created from anywhere.

HARDWARE REQUIREMENTS

COMPONENTS	QUANTITY
Raspberry Pi 3 B+	1
Raspberry Pi Cam	1
MLX90614 Infrared Temperature Sensor	1
RFID Module	1
RFID Cards	As Required
Untrasonic Sensor	2
IR Sensor	1
DC Motor	1
DC Pump	1
LCD screen	1
12V Adaptor	2
Transistor Tip32C	1
1kΩ Diode	1
Jumper Wires	As Required

○ Raspberry Pi 3 B+ :



The Raspberry Pi 3 Model B+ is the latest product in the Raspberry Pi 3 range, boasting a 64-bit quad core processor running at 1.4GHz, dual-band 2.4GHz and 5GHz wireless LAN, Bluetooth 4.2/BLE, faster Ethernet, and PoE capability via a separate PoE HAT

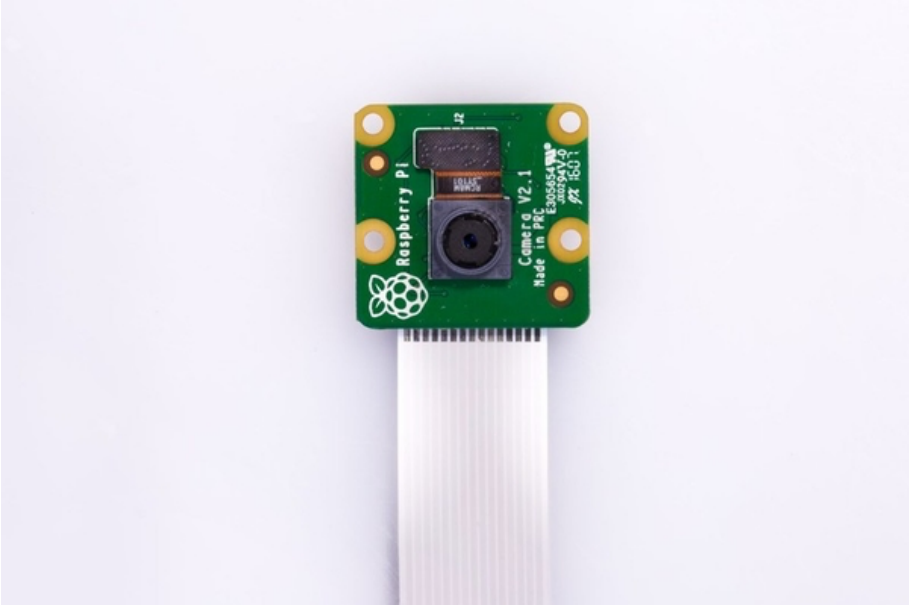
The dual-band wireless LAN comes with modular compliance certification, allowing the board to be designed into end products with significantly reduced wireless LAN compliance testing, improving both cost and time to market.

The Raspberry Pi 3 Model B+ maintains the same mechanical footprint as both the Raspberry Pi 2 Model B and the Raspberry Pi 3 Model B.

- **Specifications of Raspberry Pi 3 B+ :**

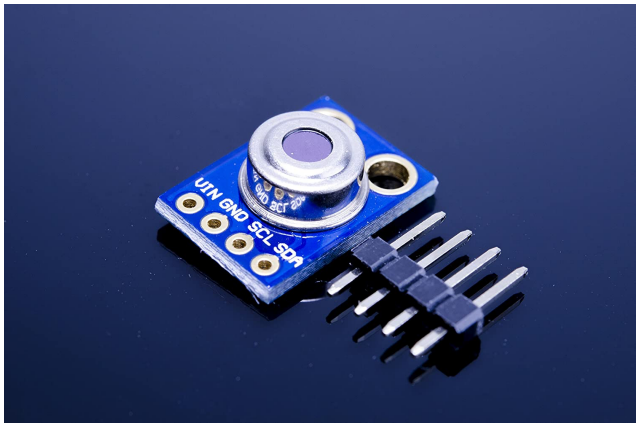
Processor:	Broadcom BCM2837B0, Cortex-A53 64-bit SoC @ 1.4GHz
Memory:	1GB LPDDR2 SDRAM
Connectivity:	• 2.4GHz and 5GHz IEEE 802.11.b/g/n/ac wireless LAN, Bluetooth 4.2, BLE • Gigabit Ethernet over USB 2.0 (maximum throughput 300 Mbps) • 4 × USB 2.0 ports
Access:	Extended 40-pin GPIO header
Video & sound:	• 1 × full size HDMI • MIPI DSI display port • MIPI CSI camera port • 4 pole stereo output and composite video port
Multimedia:	H.264, MPEG-4 decode (1080p30); H.264 encode (1080p30); OpenGL ES 1.1, 2.0 graphics
SD card support:	Micro SD format for loading operating system and data storage
Input power:	• 5V/2.5A DC via micro USB connector • 5V DC via GPIO header • Power over Ethernet (PoE)–enabled (requires separate PoE HAT)
Environment:	Operating temperature, 0–50°C
Compliance:	For a full list of local and regional product approvals, please visit www.raspberrypi.org/products/raspberry - pi-3-model-b+
Production lifetime:	The Raspberry Pi 3 Model B+ will remain in production until at least January 2023.

○ Raspberry Pi Cam V2 :



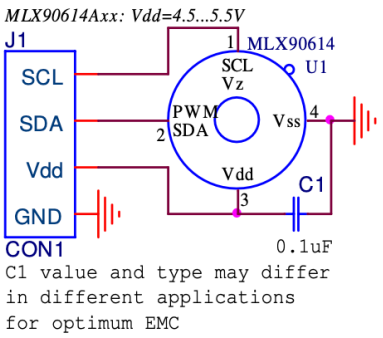
The Raspberry Pi Camera Module v2 replaced the original Camera Module in April 2016. The v2 Camera Module has a Sony IMX219 8-megapixel sensor (compared to the 5-megapixel OmniVision OV5647 sensor of the original camera).
The Camera Module can be used to take high-definition video, as well as stills photographs. It's easy to use for beginners, but has plenty to offer advanced users if you're looking to expand your knowledge. There are lots of examples online of people using it for time-lapse, slow-motion, and other video cleverness. You can also use the libraries we bundle with the camera to create effects.
You can read all the gory details about IMX219 and the Exmor R back-illuminated sensor architecture on Sony's website, but suffice to say this is more than just a resolution upgrade: it's a leap forward in image quality, colour fidelity, and low-light performance. It supports 1080p30, 720p60 and VGA90 video modes, as well as still capture. It attaches via a 15cm ribbon cable to the CSI port on the Raspberry Pi.
The camera works with all models of Raspberry Pi 1, 2, 3 and 4. It can be accessed through the MMAL and V4L APIs, and there are numerous third-party libraries built for it, including the Picamera Python library. See the Getting Started with Picamera resource to learn how to use it.
The camera module is very popular in home security applications, and in wildlife camera traps.

○ MLX90614 Temperature Sensor:



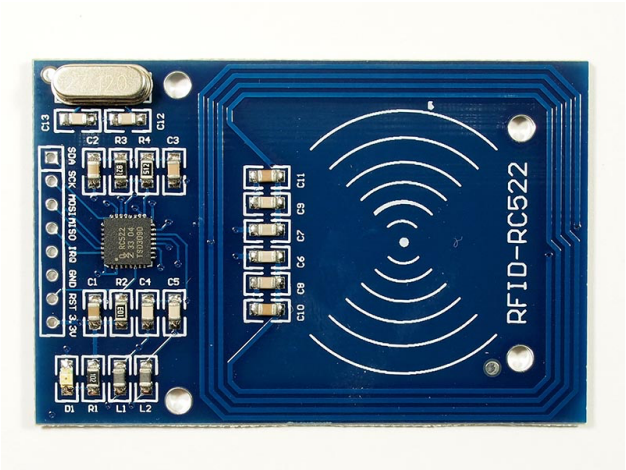
The MLX90614 is an Infra Red thermometer for non- contact temperature measurements. Both the IR sensitive thermopile detector chip and the signal conditioning ASSP are integrated in the same TO-39 can. Thanks to its low noise amplifier, 17-bit ADC and powerful DSP unit, a high accuracy and resolution of the thermometer is achieved.
The thermometer comes factory calibrated with a digital PWM and SMBus (System Management Bus) output.
As a standard, the 10-bit PWM is configured to continuously transmit the measured temperature in range of -20...120˚C, with an output resolution of 0.14˚C. The factory default POR setting is SMBus.

The MLX90614 is built from 2 chips developed and manufactured by Melexis:
- The Infra Red thermopile detector MLX81101
- The signal conditioning ASSP MLX90302, specially designed to process the output of IR sensor.



MLX90614 connection to SMBus

○ RFID Module:

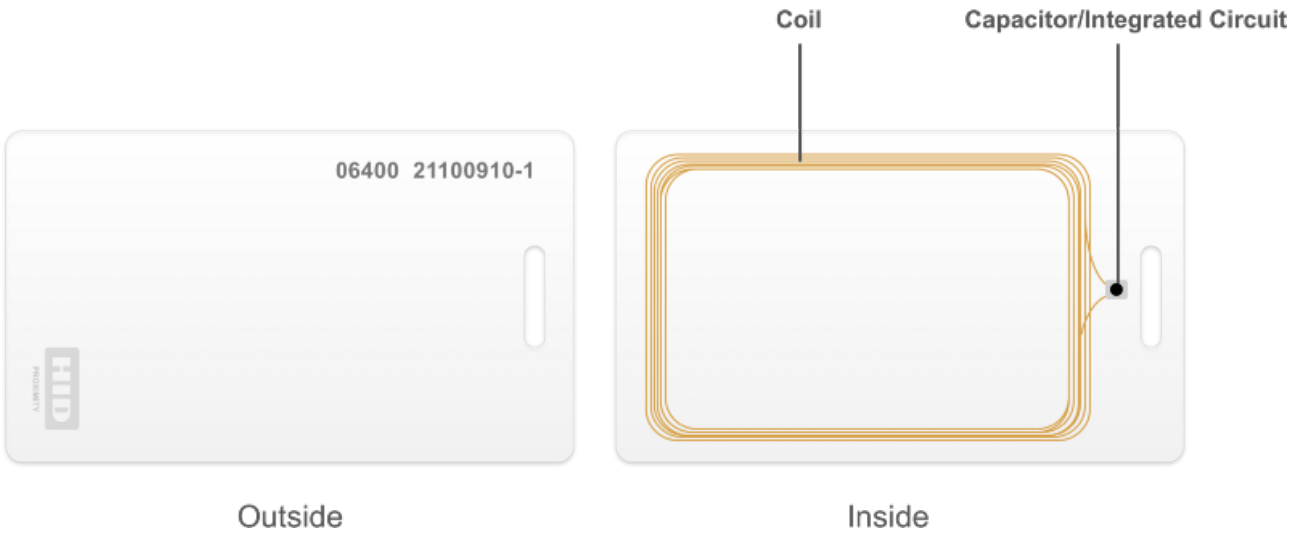


The RC522 RFID module based on MFRC522 IC from NXP is one of the most inexpensive RFID options that you can get online for less than four dollars. It usually comes with a RFID card tag and key fob tag having 1KB memory. And best of all, it can write a tag, so you can store your some sort of secret message in it.

The RC522 RFID Reader module is designed to create a 13.56MHz electromagnetic field that it uses to communicate with the RFID tags (ISO 14443A standard tags). The reader can communicate with a microcontroller over a 4-pin Serial Peripheral Interface (SPI) with a maximum data rate of 10Mbps. It also supports communication over I2C and UART protocols.

The module comes with an interrupt pin. It is handy because instead of constantly asking the RFID module “is there a card in view yet? “, the module will alert us when a tag comes into its vicinity.

○ RFID Cards / Tags:



RFID tags are made out of three pieces: a micro chip (an integrated circuit which stores and processes information and modulates and demodulates radio-frequency (RF) signals), an antenna for receiving and transmitting the signal and a substrate. The tag information is stored in a non-volatile memory. The RFID tag includes either fixed or programmable logic for processing the transmission and sensor data, respectively.

RFID tags can be either passive, active or battery-assisted passive. An active tag has an on-board battery and periodically transmits its ID signal. A battery-assisted passive tag has a small battery on board and is activated when in the presence of an RFID reader. A passive tag is cheaper and smaller because it has no battery; instead, the tag uses the radio energy transmitted by the reader. However, to operate a passive tag, it must be illuminated with a power level roughly a thousand times stronger than an active tag for signal transmission. This makes a difference in interference and in exposure to radiation.

Tags may either be read-only, having a factory-assigned serial number that is used as a key into a database, or may be read/write, where object-specific data can be written into the tag by the system user. Field programmable tags may be write-once, read-multiple; "blank" tags may be written with an electronic product code by the user.

The RFID tag receives the message and then responds with its identification and other information. This may be only a unique tag serial number, or may be product-related information such as a stock number, lot or batch number, production date, or other specific information. Since tags have individual serial numbers, the RFID system design can discriminate among several tags that might be within the range of the RFID reader and read them simultaneously.

○ Untrasonic Sensor:

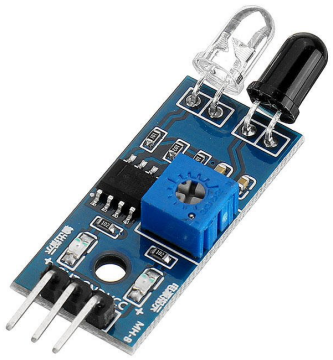
An ultrasonic sensor is an electronic device that measures the distance of a target object by emitting ultrasonic sound waves, and converts the reflected sound into an electrical signal. Ultrasonic waves travel faster than the speed of audible sound (i.e. the sound that humans can hear). Ultrasonic sensors have two main components: the transmitter (which emits the sound using piezoelectric crystals) and the receiver (which encounters the sound after it has travelled to and from the target).

In order to calculate the distance between the sensor and the object, the sensor measures the time it takes between the emission of the sound by the transmitter to its contact with the receiver. The formula for this calculation is D = ½ T x C (where D is the distance, T is the time, and C is the speed of sound ~ 343 meters/second). For example, if a scientist set up an ultrasonic sensor aimed at a box and it took 0.025 seconds for the sound to bounce back, the distance between the ultrasonic sensor and the box would be:

D = 0.5 x 0.025 x 343

or about 4.2875 meters.

○ IR Sensor:



An infrared (IR) sensor is an electronic device that measures and detects infrared radiation in its surrounding environment. Infrared radiation was accidentally discovered by an astronomer named William Herchel in 1800. While measuring the temperature of each color of light (separated by a prism), he noticed that the temperature just beyond the red light was highest. IR is invisible to the human eye, as its wavelength is longer than that of visible light (though it is still on the same electromagnetic spectrum). Anything that emits heat (everything that has a temperature above around five degrees Kelvin) gives off infrared radiation.

There are two types of infrared sensors: active and passive. Active infrared sensors both emit and detect infrared radiation. Active IR sensors have two parts: a light emitting diode (LED) and a receiver. When an object comes close to the sensor, the infrared light from the LED reflects off of the object and is detected by the receiver. Active IR sensors act as proximity sensors, and they are commonly used in obstacle detection systems (such as in robots).

○ DC Motor:

A DC motor is any of a class of rotary electrical motors that converts direct current electrical energy into mechanical energy. The most common types rely on the forces produced by magnetic fields. Nearly all types of DC motors have some internal mechanism, either electromechanical or electronic, to periodically change the direction of current in part of the motor.
DC motors were the first form of motor widely used, as they could be powered from existing direct-current lighting power distribution systems. A DC motor's speed can be controlled over a wide range, using either a variable supply voltage or by changing the strength of current in its field windings. Small DC motors are used in tools, toys, and appliances. The universal motor can operate on direct current but is a lightweight brushed motor used for portable power tools and appliances. Larger DC motors are currently used in propulsion of electric vehicles, elevator and hoists, and in drives for steel rolling mills. The advent of power electronics has made replacement of DC motors with AC motors possible in many applications.

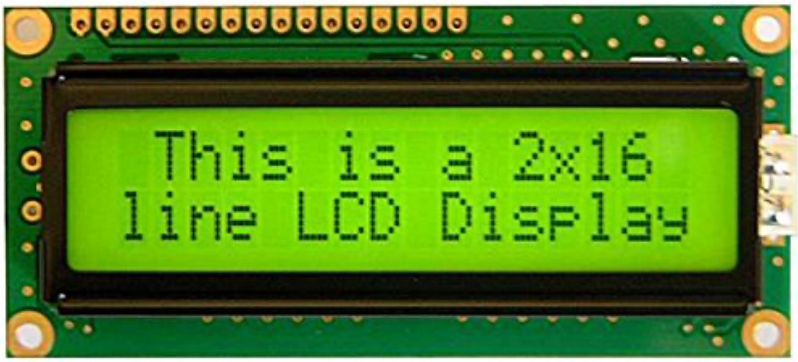
○ DC Pump:

DC powered pumps use direct current from motor, battery, or solar power to move fluid in a variety of ways. Motorized pumps typically operate on 6, 12, 24, or 32 volts of DC power. Solar-powered DC pumps use photovoltaic (PV) panels with solar cells that produce direct current when exposed to sunlight.

The main advantage of DC (direct current) pumps over AC (alternating current) pumps is that they can operate directly from a battery, making them more convenient and portable. They are easier to operate and control, since AC systems typically require a controller to manage speed. DC pumps also tend to be more efficient. However, AC pumps usually are designed for higher speeds and larger bursts of power. They also have a longer working lifespan than DC pumps.

DC pumps come in many different design types, each with its own method of operation, advantages, and preferred applications. For more information on these different types of pumps, visit the Pump Types information page on Engineering360

○ LCD Screen:



LCD (Liquid Crystal Display) is a type of flat panel display which uses liquid crystals in its primary form of operation. LEDs have a large and varying set of use cases for consumers and businesses, as they can be commonly found in smartphones, televisions, computer monitors and instrument panels.

The way a pixel is controlled is different in each type of display; CRT, LED, LCD and newer types of displays all control pixels differently. In short, LCDs are lit by a backlight, and pixels are switched on and off electronically while using liquid crystals to rotate polarized light. A polarizing glass filter is placed in front and behind all the pixels, the front filter is placed at 90 degrees. In between both filters are the liquid crystals, which can be electronically switched on and off.

SOFTWARE REQUIREMENTS

As we will be using Python as the programming language in this project, one should have knowledge of the python programming language.
One should also be familiar IDE (Integrated Development Environment) and should know to to import and download required packages.

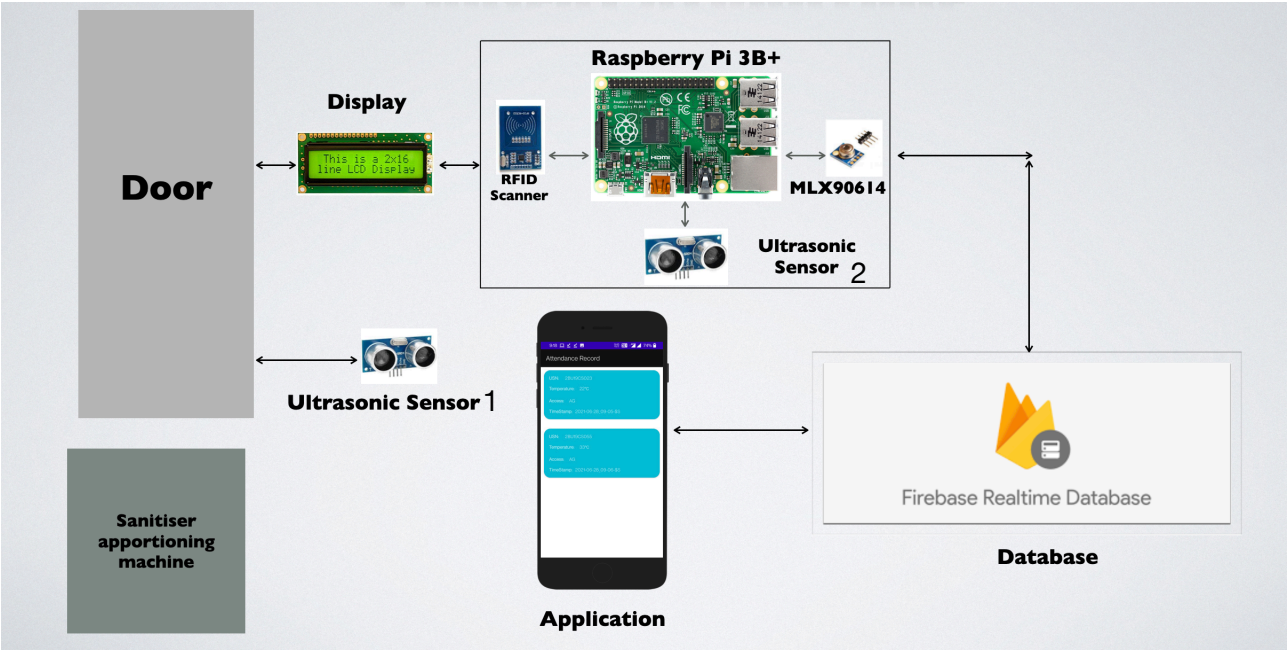
For the Android Application part one should have knowledge of Java Programming Language and Android Studio.

For the database part one should know how to use and setup Firebase Database.

What is Firebase Database?

Firebase is a toolset to “build, improve, and grow your app”, and the tools it gives you cover a large portion of the services that developers would normally have to build themselves, but don’t really want to build, because they’d rather be focusing on the app experience itself. This includes things like analytics, authentication, databases, configuration, file storage, push messaging, and the list goes on. The services are hosted in the cloud, and scale with little to no effort on the part of the developer.

PROJECT STRUCTURE



WORKING PROCESS

As we can see in the project structure, we are using ans Raspberry Pi 3 B+ as a computing device to control the components of the project.

The components connected to the Raspberry Pi are MLX90614 Infrared Temperature Sensor, Ultrasonic Sensor 1, Ultrasonic Sensor 2, RFID Scanner, LCD Display and the Sliding Door mechanism.

So, whenever an individual willing to enter the premises where this system is installed, he/she comes near the door, the ultrasonic sensor detects the movement and sends a signal to the raspberry pi which then sends a signal to the LCD display asking the individual to scan his?her RFID ID card. When the individual scans the ID card is/her temperature is taken using MLX90614 Infrared Temperature Sensor and an image is taken of the individual using the raspberry cam.
This data with the timestamp is then stored in the Firebase Database created. And on the off chance that the individuals temperature is right according to the Covid-19 standards the door of the premises opens for the individual.

But when an individual willing to come out of the premises he/she should come near the door, the ultrasonic sensor 2 detects the movement and sends a signal to the raspberry pi asking to open the door and the door will be open.

An sanitizer dispensing machine will be kept at the entryways which will apportion sanitiser consequently at whatever point the individual's hand is under the distributor and the individual need not touch the container.

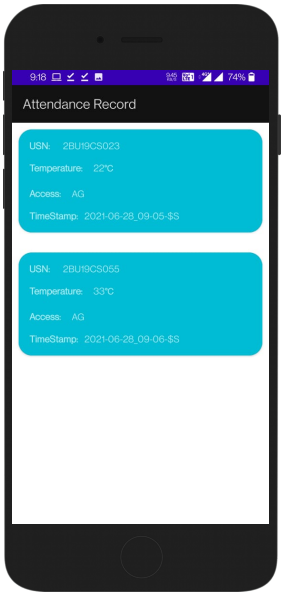
An android application has been created which retrieves the data stored in the database. An Admin can use this application to monitor the individuals entering the premises.

APPLICATION DESIGN

The admin monitoring the attendance of individuals can access the realtime database with the application created from any part of the world.

○ Components of the App

- Data
- RecyclerView scrolling list for list items—RecyclerView
- Layout for one item of data—XML file
- Layout manager handles the organization of UI components in a view—Recyclerview.LayoutManager
- Adapter connects data to the RecyclerView—RecyclerView.Adapter
- View holder has view information for displaying one item—RecyclerView.ViewHolder



○ What is a Recycler View?

- Scrollable container for large data sets
- Efficient
- Uses and reuses limited number of views
- Updates changing data fast

○ What is a layout manager?

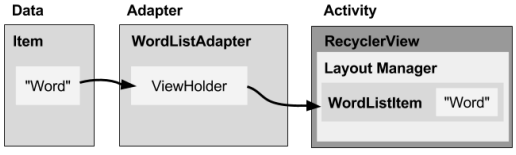
- All view groups have layout managers
- Positions item views inside a RecyclerView.
- Reuses item views that are no longer visible to the user
- Built-in layout managers include LinearLayoutManager, GridLayoutManager, and StaggeredGridLayoutManager
- For RecyclerView, extend RecyclerView.LayoutManager

○ What is an adapter?

- Helps incompatible interfaces work together, for example, takes data from a database Cursor and puts them as strings into a view
- Intermediary between data and view
- Manages creating, updating, adding, deleting item views as the underlying data changes
- RecyclerView.Adapter

○ What is a view holder?

- Used by the adapter to prepare one view with data for one list item
- Layout specified in an XML resource file
- Can have clickable elements
- Is placed by the layout manager
- RecyclerView.ViewHolder



PROJECT CODE

- **Code to control the components connected to Raspberry Pi :**

```
import time
import cv2
import os
import pyrebase


def cls():
    print("\n"* 15)


def main():

    def doorUnlock():
        print("Door is open!")
        time.sleep(3)
        cls()
        main()

    s = int(input("Sensor:"))

    if s == 1:
        doorUnlock()

    while True:

        firebaseConfig = {
            'apiKey': “ ",
            'authDomain': “ ",
            'databaseURL': “ ",
            'projectId': “ ",
            'storageBucket': “ ",
            'messagingSenderId': “ ",
            'appId': “ ",
            'measurementId': “ "
        }


        firebase = pyrebase.initialize_app(firebaseConfig)

        storage = firebase.storage()

        database = firebase.database()

        print("Starting Camera...")

        time.sleep(2)

        cls()

        # os.system('clear')

        cap = cv2.VideoCapture(0)

        print("Camera Started...")
```

```
    time.sleep(2)

    cls()

    while True:

        _, img = cap.read()

        k = cv2.waitKey(10) & 0xff

        cv2.imshow('img', img)

        t = time.strftime("%Y-%m-%d_%H-%M-$S")

        if s == 0:                  # if k == ord('c') or k == ord('C'):
            print("\n\nWelcome to SGBIT.\nPlease wear yor mask and maintain social distancing.")
            print("Scan your ID card...")
            time.sleep(3)
            usn = input("Enter yor USN: ")
            temp = int(input("Enter your Temperature: "))

            if temp <= 37:
                p = 'AG'
                file = usn+'_'+str(temp)+'°C_'+p+'_'+t+'.jpeg'
                print("Capturing Image...")
                time.sleep(3)
                cv2.imwrite(file, img)
                cv2.imread(file)
                print("Image Captured")
                print("Access Granted!")
                storage.child(file).put(file)
                url = storage.child(file).get_url(file)
                data = {"USN" : usn, "Temperature" : str(temp)+"°C", "TimeStamp" : t,  "Access" : p,
"Image" : file, "ImgURL" : url}
                database.child("Attendance").push(data)
                os.remove(file)
                doorUnlock()

            else:
                p = 'AD'
                file = usn+'_'+str(temp)+'C_'+p+'_'+t+'.jpeg'
                print("Capturing Image...")
                time.sleep(3)
                cv2.imwrite(file, img)
                cv2.imread(file)
                print("Image Captured")
                print("Access Denied!")
                storage.child(file).put(file)
                url = storage.child(file).get_url(file)
                data = {"USN" : usn, "Temperature" : str(temp)+"°C", "TimeStamp" : t,  "Access" : p,
"Image" : file, "ImgURL" : url}
                database.child("Attendance").push(data)
                os.remove(file)
                cls()
                main()

        elif k == ord("q"):
            print("Closing the window.\nBye!")
            exit()


main()
```

Python Packages Used:

- **OpenCV Package for Python:**

OpenCV is the huge open-source library for the computer vision, machine learning, and image processing and now it plays a major role in real-time operation which is very important in today's systems. By using it, one can process images and videos to identify objects, faces, or even handwriting of a human.

- **Pyrebase:**

Pyrebase is a Python interface to Firebase's REST API. In layman's terms, it allows you to use Python to manipulate your Firebase database

The Pyrebase module provides a simple interface for performing each of the CRUD functions. There are two methods available for creating a new data entity in your database, push() and set(). These methods can be used in conjunction with the child() method, which builds paths to objects in the database.

Python Modules Used:

- **time Module:**

The Python time module provides many ways of representing time in code, such as objects, numbers, and strings. It also provides functionality other than representing time, like waiting during code execution and measuring the efficiency of your code.

- **OS Module:**

The OS module in Python provides functions for interacting with the operating system. OS comes under Python's standard utility modules. This module provides a portable way of using operating system dependent functionality. The *os* and *os. path* modules include many functions to interact with the file system.

***Note:** The code given in this report is the computer run version of this project. The code may change after connecting the hardware.

ADVANTAGES

By adapting this system an organization will be able to maintain wellbeing and security in their premises. The main advantage of this system is that it lessens the need of a worker on duty to check the temperature of individuals entering the premises and to apportion sanitizer. This will reduce the danger the worker goes through in the existing system of temperature checking.
As this system stores the data of individuals entering the premises, Schools/Colleges can also use the data as attendance record.

APPLICATIONS

- This system can be used in Schools, Colleges, Banks, Corporate Offices, etc
- Used for temperature checking.
- It is also used to record attendance of students, employees and staff.

FUTURE ENHANCEMENTS

Since we are using the OpenCV package this system can further be updated with face detection and the user need not scan his/her ID cards every time they enter the premises.

In future we can make users for the application created so that users can see their history of temperatures recorded.

The user interface of the application will be enhanced to make the application more user friendly.

REFERENCES

Reference For:	Link:
Application in Android Studio	https://youtu.be/sZ8D1-hNeWo
Automatic Sanitizer Dispenser	https://youtu.be/MOY-XGk6jrs
Sliding Door	https://youtu.be/kZuQP9Ezqpw

CONCLUSION

So the ultimate aim of this project is to maintain wellbeing of individuals and security. We would like to conclude by saying that every institution should opt for this framework as it requires very less manpower hence reducing the risk to their lives.