

A Project Report on

# **An IOT based framework for Statistical Analysis and Screening of Covid-19**

Submitted in partial fulfillment of the requirements for the award  
of the degree of

**Bachelor of Engineering**

in

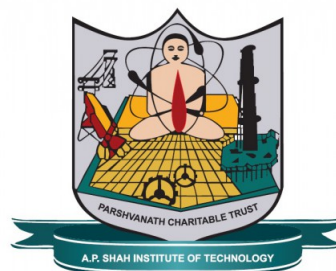
**Information Technology**

by

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UNIVERSITY OF MUMBAI

**Academic Year 2021-2022**

## Approval Sheet

This Project Report entitled “*An IOT based framework for Statistical Analysis and Screening of Covid-19*” Submitted by “*Pratik Gholap*”(18104070 ), “*Apoorva Gadkari*”(18104043), “*Priyanka Walekar*”(19204008) is approved for the partial fulfillment of the requirement for the award of the degree of *Bachelor of Engineering* in *Information Technology* from *University of Mumbai*.

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## CERTIFICATE

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## Acknowledgement

We have great pleasure in presenting the report on **An IOT based framework for Statistical Analysis and Screening of Covid-19** We take this opportunity to express our sincere thanks towards our guide **Dr. U. D. Kolekar** & Co-Guide **Prof. Sonal Jain** Department of IT, APSIT thane for providing the technical guidelines and suggestions regarding line of work. We would like to express our gratitude towards his constant encouragement, support and guidance through the development of project.

We thank **Prof. Kiran B. Deshpande** Head of Department,IT, APSIT for his encouragement during progress meeting and providing guidelines to write this report.

We thank **Prof. Vishal S. Badgujar** BE project co-ordinator, Department of IT, APSIT for being encouraging throughout the course and for guidance.

We also thank the entire staff of APSIT for their invaluable help rendered during the course of this work. We wish to express our deep gratitude towards all our colleagues of APSIT for their encouragement.

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## Declaration

We declare that this written submission represents our ideas in our own words and where others' ideas or words have been included, We have adequately cited and referenced the original sources. We also declare that We have adhered to all principles of academic honesty and integrity and have not misrepresented or fabricated or falsified any idea/data/fact/source in our submission. We understand that any violation of the above will be cause for disciplinary action by the Institute and can also evoke penal action from the sources which have thus not been properly cited or from whom proper permission has not been taken when needed.

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## Abstract

One of the most Terrifying outbreaks in recent times has been the outbreak of COVID-19. The extent of this disease can be understood by the fatality rate of this disease. “Precaution is always better than a cure” It is a quote that everyone has heard of at least once in their lifetime and is prevalent in the case of preventing the spread of Covid-19. Also, Many countries are hiring or staying at home Blockade guidelines to control its spread. However, you can stay at home longer Causes adverse effects such as economic crisis, unemployment, food shortages, and mental health problems Personal health problems There must be a question in mind about how we can take extra precautions from Covid19 ? The simple answer is following the rules given by the government and continuously monitoring the factors which indicate the symptoms. This project is basically of designing an IoT framework will be having a temperature sensor LM35 for checking body temperature, a pulse sensor to detect pulse rate, and a SpO2 for oxygen rate detection and SW-420 for Cough Detection.

A low-power wireless respiratory monitoring system for cough detection is proposed to detect various parameters that are required for the overall detection of this illness of peoples health. Further, this data will be processed on Raspberry Pi Model 3B+ where Support Vector Machine algorithm will be performed and send the prediction of the disease on the application as a conclusive Solution.

Also, this data will be displayed over the website in the form of a dataset that can be used for future studies. The proposed system will always be used when a person comes outside from the house as a precaution and it can be used for actual patient monitoring and thus can be used for effective analysis and detection of this illness.

**Keywords:** Arduino UNO, SpO2, LM35, SVM Algorithm, MAX30100 Sensor

# Contents

|          |  |           |
|----------|--|-----------|
| <b>1</b> | <b>Introduction</b>                    | <b>1</b>  |
| <b>2</b> | <b>Literature Review</b>               | <b>3</b>  |
| <b>3</b> | <b>Project Design</b>                  | <b>5</b>  |
| 3.1      | IOT Based Framework . . . . .          | 5         |
| 3.2      | Proposed System Architecture . . . . . | 6         |
| 3.3      | Class Diagram . . . . .                | 7         |
| 3.4      | Flow Chart . . . . .                   | 8         |
| 3.5      | Use Case Diagram . . . . .             | 9         |
| <b>4</b> | <b>Project Implementation</b>          | <b>10</b> |
| <b>5</b> | <b>Testing</b>                         | <b>23</b> |
| 5.1      | Unit Testing . . . . .                 | 23        |
| 5.2      | Integration Testing . . . . .          | 23        |
| <b>6</b> | <b>Result</b>                          | <b>24</b> |
| 6.1      | Software . . . . .                     | 24        |
| 6.2      | Hardware . . . . .                     | 31        |
| <b>7</b> | <b>Conclusions and Future Scope</b>    | <b>32</b> |
|          | <b>Publication</b>                     | <b>34</b> |

# List of Figures

|     |                                 |    |
|-----|---------------------------------|----|
| 3.1 | Class Diagram . . . . .         | 7  |
| 3.2 | Flow Chart . . . . .            | 8  |
| 3.3 | Use Case Diagram . . . . .      | 9  |
| 6.1 | Registration . . . . .          | 24 |
| 6.2 | Login . . . . .                 | 25 |
| 6.3 | Home . . . . .                  | 26 |
| 6.4 | Add Test . . . . .              | 27 |
| 6.5 | History . . . . .               | 28 |
| 6.6 | Contact Us . . . . .            | 29 |
| 6.7 | Vitals Capturing Site . . . . . | 30 |
| 6.8 | Hardware Device . . . . .       | 31 |



# List of Tables

|     |                             |   |
|-----|-----------------------------|---|
| 3.1 | Sensor List Table . . . . . | 6 |
|-----|-----------------------------|---|

# List of Abbreviations

|           |                        |
|-----------|------------------------|
| SVM:      | Support Vector Machine |
| COVID-19: | Novel Coronavirus      |
| IOT:      | Internet of Things     |
| ML:       | Machine Learning       |

# Chapter 1

## Introduction

WHO has designated the 2019 coronavirus disease as "COVID 19" in February 2021. Since the first confirmed case of COVID19, researchers in over thirty countries and regions around the world have been working hard to find a cure. attempting to controlling and treat COVID19 The Internet of Things (IoT) the system, the most recent and the computerization of information, devices, and intelligent management and monitoring over the internet will be the most common technology of the twenty-first century the network of time intervals As a result, it is critical in this contexts.to put the project in use of clinical drugs Interference with the COVID19 Pandemic and work in Management Managing the COVID19 Alito system is critical not only for patients but also for the general public. Wearable devices will be used by people to individual monitoring, observation, and recording daily breathing rate, heart rate, body temperature and other physiological values, and thus in making decisions for themselves Even if they are isolated, they will quickly comprehend Changes in their vital signs Surprisingly, in the field of scientific application.

The Internet of Things device will accelerate the recent event of intelligent medical aid as a result, it is used for remote sensing, intelligent labeling, , and remote medical control. This is regarding a significant breakthrough in pandemic disruption and handling standards. When reading image scan reports, the speed and accuracy are both slow manually. The smart name is intended to make it more appealing as an auxiliary technology frontline doctors' ability to quickly determine whether patients are infected with COVID19, to isolate patients and begin treatment steps. Even so, these were cured When patients are discharged from the hospital, doctors will use 5G technology, Wi-Fi, and other tools or a variety of third-party mobile devices to request comprehension of the changes in their vital body signs and then make the appropriate recommendations, and in the context of telemedicine, recommendations that are viewed collectively can be developed. Furthermore, when there is a labour shortage or Telemedicine and medical facilities it, will make it easier to solve this problem. to a certain extent, without any risk of cross-infection and mutual human contact.

The IoT not only plays an important role in clinical medical treatment, but it also plays a role in research collectively facilitates public society management in general, The Internet of Things is critical for the agricultural/industrial chain to develop intelligent infrastructure, which will make life easier for all humanity. to stand up to the new coronavirus with distinct characteristics One can now say that the pandemic is under control Step by step, an increasing number of businesses, both large and small, are turning to Amazon Web Ser-

vices(A.W.S.).

In an attempt to resolve the issue, IoT technology will be used to resume their work and production. the conundrum caused by the pandemic 3 Coronavirus disease (Covid19) claims thousands of lives each year and infects millions more. A severe infection with the current virus causes respiratory problems. A disease in which a higher heart rate and breathing rate are associated with sub-optimal performance Saturation of oxygen Measuring a Wide Range of Health Parameters to Aid in the Diagnosis of Respiratory Diseases Two of the factors are heart rate and blood oxygen saturation (SpO2) most important health parameters in addition to some additional health parameters for identifying respiratory diseases like bronchitis As technology advances, Non-invasive measurements have been made in a variety of ways by a number of researchers and scientists. We have developed embedded hardware prototypes with embedded and IoT, but few have studied their performance and thus calculated/calculated the minimum error rate relatively to get an adequate estimate about disease diagnosis. We tend to develop a heart rate based primarily on Arduino and oxygen. Saturation and performance analysis of the Max30100 measurement system kit We typically use the device on more than 12 different ages of test subjects and compare the results to a reference device, the Rossmax SB150 pulse measurement system. With the rise in coronavirus cases and deaths worldwide, the demand for health monitoring parameters have increased.

This project will assist in resolving some of the issues that need to be addressed and will be of great benefit to the community. This IoT Framework will assist a large number of people in monitoring their vital status on a daily basis through the use of a sophisticated device, as well as in generating data that can be used for research purposes.

# Chapter 2

## Literature Review

[1] Paper: Dhiraj Sunehra, Pini Ramakrishna, “Web-based patient health monitoring system using Raspberry Pi”, IEEE, 04 May 2017.

Various basic human physiological parameters such as pressure, heart rate, blood oxygen saturation (SPO2), body temperature, and fall detection are measured by relevant sensors and sent to the plate Arduino microcontroller to continue the process. Raspberry Pi is primarily based on an internet server for display on the website. Communication between Arduino and Raspberry Pi. The Themenary package develops Arduino Victimization IDE and Python language.

[2] Paper: R.Kumar, Dr.M.Pallikonda Rajasekaran, “An IOT Based Patient Monitoring System using Raspberry Pi”, IEEE, 31 October 2016.

Temperature, breathing, patient movements, and heart rate readings are monitored. The signals from these sensors are sent to the Raspberry Pi via the amplifier circuit and the signal learning unit (SCU) due to the low signal level (amplification). Therefore the amplifier circuit is used to generate the signal and to transmit the signals to the Raspberry Pi. Here is the warmth of the patient’s blood, the body movements during sleep. The position, respiration, and pulse frequency are measured by victimization sensors and are often monitored in the specification of monitors of raspberry Pi-laptop victimization in a similar manner that transfers the victim of NetSource within the world.

[3] Paper: M. Surya Deekshith Gupta, Vamsikrishna Patchava, Virginia Menezes, “Health-care based on IoT using Raspberry Pi”, IEEE, 14 January 2016.

As an abbreviation, the Python programming language is used to communicate with graphical logging engines and to modify the victim database website, MySQLdb. Update the information on the website with new health parameters. If the heartbeat is in the traditional range, monitoring continues. Sends alert to the authorized person by sending SMS via GSM.

[4] Paper: M. Udin Harun Al Rasyid, Alif Akbar Pranata, Bih-Hwang Lee, Ferry Astika Saputra, Amang Sudarsono, “Portable electrocardiogram sensor monitoring system based on body area network”, IEEE, 28 July 2016.

The device measures the graphical protocol signals continuously and therefore the signals are recorded by the e-Health device. These values represent the square of the USB cable streamed to a Raspberry Pi for victimization. The minicomputer processes the information and displays the value on the monitor like a terminal console. together they show diagrams

corresponding to these ECG values.

[5] Paper: Tripathy, A.K.; Mohapatra, A.G.; Mohanty, S.P.; Kougianos, E.; Joshi, A.M.; Das, G. EasyBand: A Wearable for Safety-Aware Mobility During Pandemic Outbreak. *IEEE Consum. Electron. Mag.* 2020, 9, 57–61.

The Author has discussed on the device helps in alerting for social distancing by auto contact tracing technology which will also help in limiting the growth of the virus. The overview of the system architecture is present in the paper, How it will be working in the tight area and loose contact.

[6] Paper: Yamanoor, N.S.; Yamanoor, S. Low-Cost Contact Thermometry for Screening and Monitoring during the COVID-19 Pandemic. In *Proceedings of the 2020 IEEE International IOT, Electronics and Mechatronics Conference (IEMTRONICS)*, Vancouver, BC, Canada, 9–12 September 2020; pp. 1–6.

The author has discussed the device which can be used for monitoring temperature using MAX30205 sensor embedded with the Arduino in the form for small band by making consideration on Low-Cost Modelling.

[7] Zhu, Y.; Chen, L.; Ji, H.; Xi, M.; Fang, Y.; Li, Y. The risk and prevention of novel coronavirus pneumonia infections among inpatients in psychiatric hospitals. *Neurosci. Bull.* 2020, 36, 299–302.

The Author has summarized prevention measures and the threat related to the coronavirus pneumonia infections how they unfold commenced and its upward push within the shape of the statistics. Several Coping Strategies wherein stated to assist in getting off the pandemic via way of means of making a small contribution.

[8] Tahamtan, A.; Ardebili, A. Real-time RT-PCR in COVID-19 detection: Issues affecting the results. *Expert Rev. Mol. Diagn.* 2020, 20, 453–454.

The Author provides a summary on how the RT-PCR method is useful for detecting COVID19 annotated as the “Golden Standard” for detection. However how this test can be improved by converting it into a real-time RT-PCR test which will help in real-time to diagnose the infection early. Also, some of the important issues are discussed using this technique.

[9] Manta, C.; Jain, S.S.; Coravos, A.; Mendelsohn, D.; Izmailova, E.S. An Evaluation of Biometric Monitoring Technologies for Vital Signs in the Era of COVID-19. *Clin. Transl. Sci.* 2020, 13, 1034–1044.

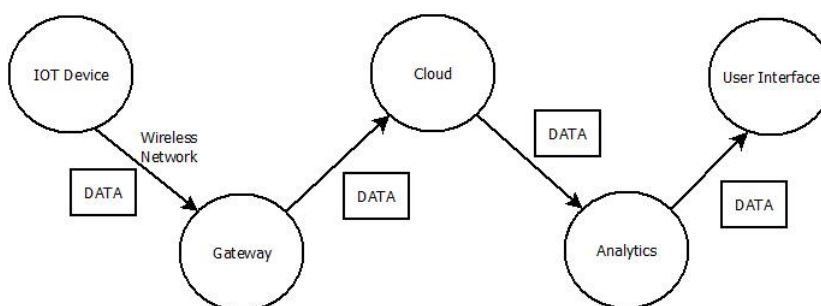
The author provided a summary of BioMeT (Biometric Monitoring Technologies) that can be used for collection. Vital signs (blood pressure, heart rate, body temperature, respiratory rate, oxygen saturation) About the strengths and weaknesses of the continuous monitoring process Corona time.

# Chapter 3

## Project Design

### 3.1 IOT Based Framework

Due to the significant increase in the use of the Internet, most devices and devices are connected to the Internet, forming the Internet of Things. The IoT is a lot more than just a technology. This is a complex framework that includes various technologies are designed to work together. What is the IoT framework? It is a sophisticated framework that includes several different technologies, designed to work together in tandem. The Internet of Things (IoT) Framework can be described as being an ecosystem, comprising several connected devices that communicate with each other, over the Internet. These connected devices sense the environment and send the data over the internet while requiring very little human intervention. The IoT framework is what makes it possible for connected devices to have smooth communication over the Internet. It's no surprise that it's known as the Internet of Things Framework, a framework that makes it easier for "things" (devices) to interact on the Internet.



Data is sent via a wireless network to the cloud for storage. From the cloud, this information/data is then analyzed using the SVM algorithm to come at a desirable output for the end-user. Lastly, this information analyzed will be presented in the form of a user application So that the end-user can have a better understanding even if the person is new to the tech. This also ensures that any person can understand the data regardless of age.

## 3.2 Proposed System Architecture

The Hardware Framework will be used to collect the information on vitals and the data generated will be stored in a database where the details of the user will be stored along with their device number which will be an ID as identification for the users. A table will be created storing results all the results and a link will be generated to see in detail the result which will be shown on the website.

The sensors were chosen as follows.

Table 3.1: Sensor List Table

| Purpose                          | Sensor   | Technology  | Composition   | Performance/ Calibration   |
|----------------------------------|----------|---|---|--|
| Measuring human body temperature | LM-35    | LM-35 is an integrated Analog temperature sensor whose electrical output is proportional to Degree Centigrade. LM35 Sensor does not require any external calibration or trimming to provide typical accuracies. | Consists one <u>Vcc</u> , Analog out and ground pin                                 | Lm35 can measure from 55 degree centigrade to 150-degree centigrade. The accuracy level is very high if operated at optimal temperature and humidity levels. The conversion of the output voltage to centigrade is also easy and straight forward. |
| Cough detection and variation    | SW-420   | Doppler radar, continuous-wave (CW) radar, vibration detection.   | Breakout board that includes comparator LM393                                       | Adjustable on-board potentiometer for sensitivity threshold selection.   |
| Pulse/heart-rate & oxygen rate   | MAX30100 | Uses red and infrared frequency of light to determine the percentage of haemoglobin in the blood.   | Two LEDs, a photodetector, enhanced optics, and low-noise Analog signal processing. | Programmable from 200 microseconds to 1.6 milli sec to optimize measurement accuracy   |

This data will have to be processed via ML algorithm (SVM algorithm) where the result will be shown on an app. A simple interface mobile application is presented after applying the algorithm to the data. After the user logs, in this page will direct the user to further pages depending upon whether the user is a first-time user or a registered user. Here, the registered user will have his/her history of the previous test results if the user has conducted any previous test, Current/Latest generated data will be displayed in the form of animated meters stuff and a message with a questionnaire that the user has to fill and all this data clubbed together will be displayed in the webpage.

The webpage will have a support page that will show her the information of the result along with a link to show in-depth test results. The website will have four buttons to download the data in different formats like CSV, XLS, PDF, etc. for personal use or further research study. An email will be used as a communication medium if anyone needs to contact me regarding datasets. The website where all the details are shown will be in a very understandable format to help people study the data with the least trouble.



The Webpage/Website is not a process for normal user/user. This website will just be having the data which can be used only for research purposes.

### 3.3 Class Diagram

Class Diagram is depicting the review of classes, a good way to be used whilst constructing the project. Entity magnificence is having the facts of the consumer who has registered self in software for purchasing the outcomes from the hardware, the outcomes which might be acquired with the aid of using hardware is saved in the Raspberry pi System magnificence. SVM is depicting the techniques which might be going to name for reading and acting ML set of rules to the records furnished with the aid of using the hardware.

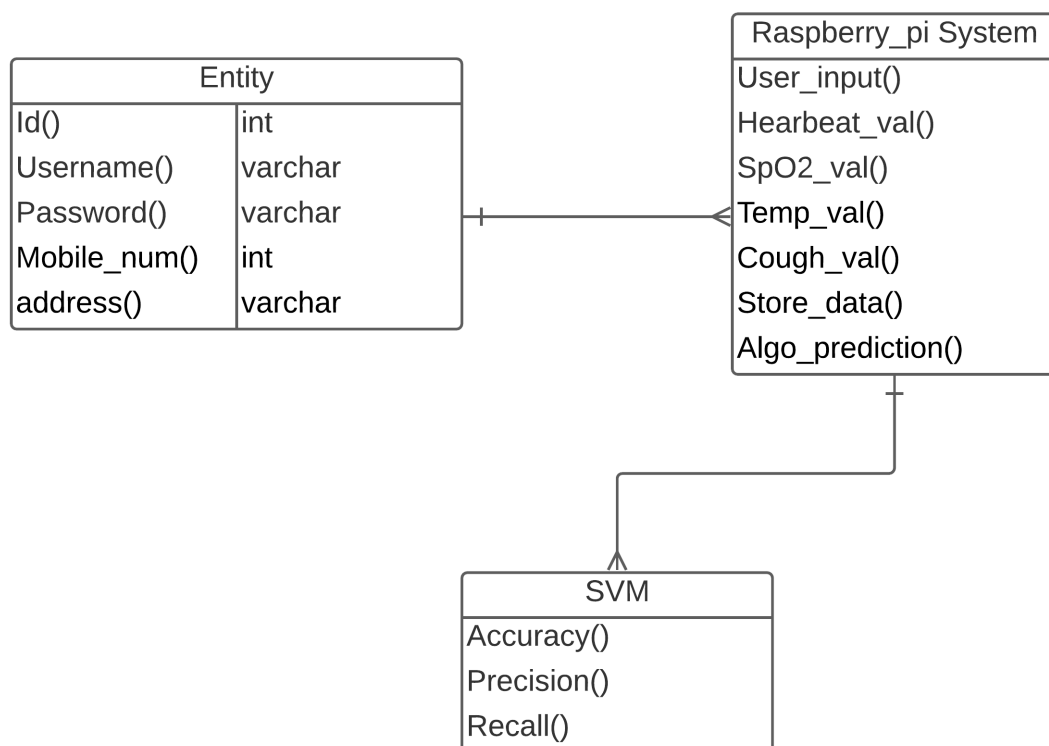


Figure 3.1: Class Diagram

### 3.4 Flow Chart

Flow chart is showing how the data is going to flow from hardware to software. The data which is generated by hardware is going to store in cloud where it is going to perform ML algorithm from where the generated result is shown on the mobile app where user can see the prediction like negative or positive as well as the values of collected data.

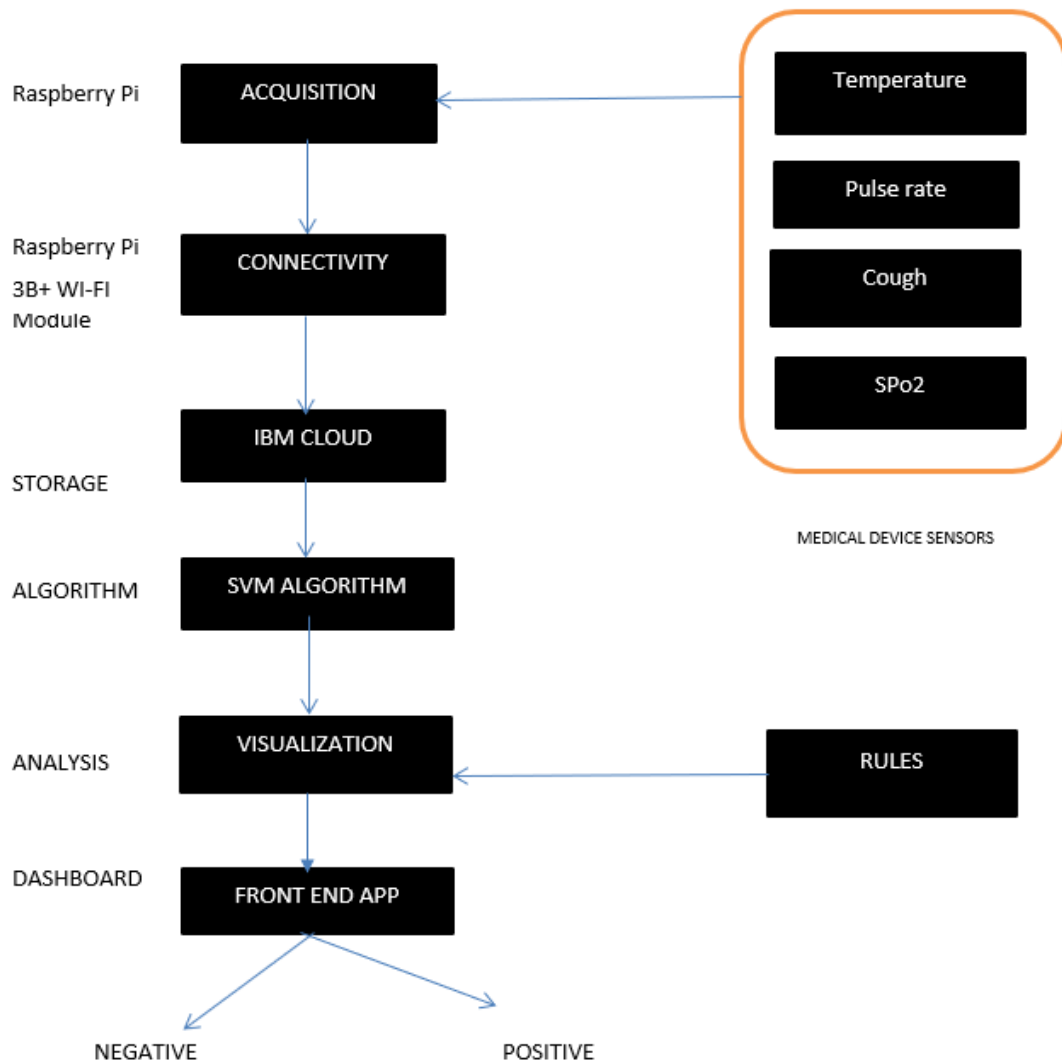


Figure 3.2: Flow Chart

### 3.5 Use Case Diagram

Flow chart is showing how the data is going to flow from hardware to software. The data which is generated by hardware is going to store in cloud where it is going to perform ML algorithm from where the generated result is shown on the mobile app where user can see the prediction like negative or positive as well as the values of collected data.

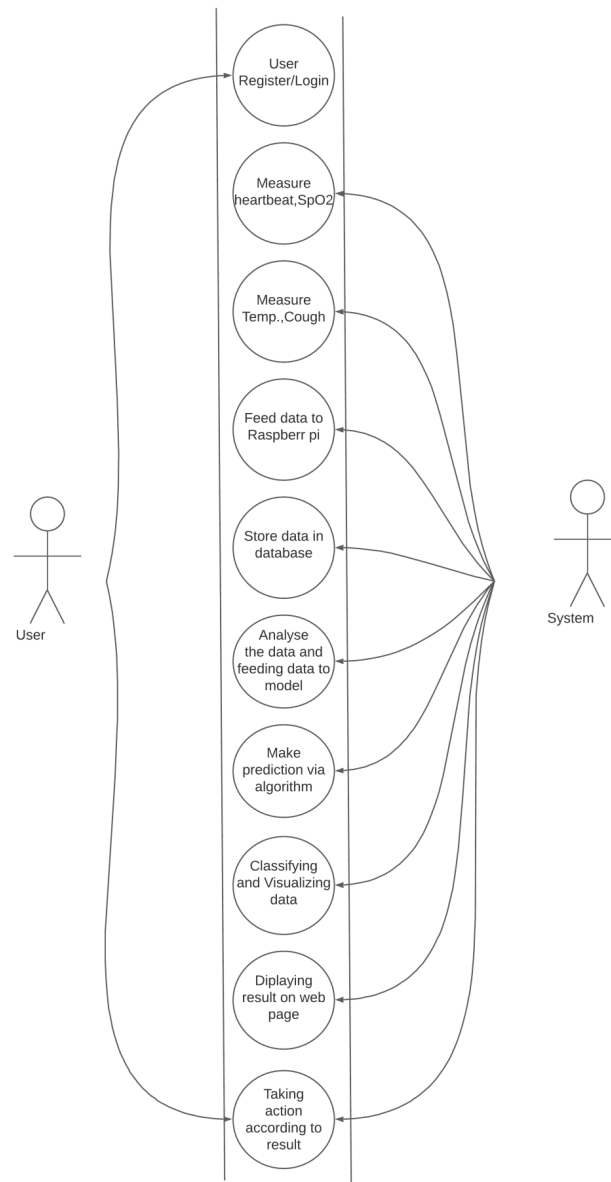


Figure 3.3: Use Case Diagram

# Chapter 4

## Project Implementation

- Main Activity.java

```
package com.baecon.covid19;

import androidx.appcompat.app.AppCompatActivity;

import android.content.Intent;
import android.os.Bundle;
import android.os.StrictMode;
import android.view.View;
import android.widget.Button;
import android.widget.EditText;
import android.widget.Toast;

import org.apache.http.NameValuePair;
import org.apache.http.message.BasicNameValuePair;
import org.json.JSONException;

import java.util.ArrayList;
import java.util.List;

public class MainActivity extends AppCompatActivity {

    EditText edit1,edit2,edit3,edit4;
    Button btn;

    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);

        edit1=findViewById(R.id.username);
        edit2=findViewById(R.id.pass);
```

```

edit3=findViewById(R.id.mail);
edit4=findViewById(R.id.no);
btn=findViewById(R.id.reg);

btn.setOnClickListener(new View.OnClickListener() {
    @Override
    public void onClick(View view) {

        String username = edit1.getText().toString();
        String pass = edit2.getText().toString();
        String mail = edit3.getText().toString();
        String no = edit4.getText().toString();

        if(username.equals("")||mail.equals("")||
            no.equals("")||pass.equals("")){
            Toast.makeText(MainActivity.this, "Please enter
            username or password or mobile number or email",
            Toast.LENGTH_SHORT).show();

        }if(username.length()<8)
        {
            Toast.makeText(MainActivity.this,"username must be
            of 8 alphabates",Toast.LENGTH_SHORT).show();
        }
        else if(pass.length()<8)
        {
            Toast.makeText(MainActivity.this,"Password must be
            of 8 alphabates",Toast.LENGTH_SHORT).show();
        }

        else {
            StrictMode.ThreadPolicy policy = new
            StrictMode.ThreadPolicy.Builder().permitAll().build();
            StrictMode.setThreadPolicy(policy);
            String url = UrlLinks.pyregister;

            List<NameValuePair> nameValuePairs = new
            ArrayList<NameValuePair>(4);

            nameValuePairs.add(new
            BasicNameValuePair("username", username));
            nameValuePairs.add(new BasicNameValuePair("pass",
            pass));
            nameValuePairs.add(new BasicNameValuePair("mail",

```

```

mail));
nameValuePairs.add(new BasicNameValuePair("no",
no));

String result = null;
try {
    result =
        jSONClassforData.forCallingStringAndreturnString(
            url,nameValuePairs);
} catch (JSONException e) {
    e.printStackTrace();
}

if (result.equals("success")) {

    Toast.makeText(MainActivity.this, "User Added
    successfully", Toast.LENGTH_SHORT).show();
    Intent io = new Intent(MainActivity.this,
    login.class);

    startActivity(io);
    finish();

} else {

    Toast.makeText(MainActivity.this, "Wrong
    username or password",
    Toast.LENGTH_SHORT).show();

}

}

}

});

}

}

```

- **History.java**

```
package com.baecon.covid19;

import androidx.appcompat.app.AppCompatActivity;
import androidx.recyclerview.widget.LinearLayoutManager;
import androidx.recyclerview.widget.RecyclerView;

import android.net.Uri;
import android.os.AsyncTask;
import android.os.Bundle;
import android.os.StrictMode;
import android.text.Editable;
import android.text.TextWatcher;
import android.util.Log;
import android.widget.EditText;
import android.widget.ImageButton;
import android.widget.TextView;

import org.apache.http.NameValuePair;
import org.apache.http.message.BasicNameValuePair;
import org.json.JSONArray;
import org.json.JSONException;

import java.io.BufferedReader;
import java.io.IOException;
import java.io.InputStreamReader;
import java.net.HttpURLConnection;
import java.net.URL;
import java.util.ArrayList;
import java.util.List;
import java.util.Map;

public class history extends AppCompatActivity {

    EditText Searchtext;
    private ExampleAdapter adapter;
    ImageButton bt_mic;
    private List<ExampleItem> exampleList;
    private List<ExampleItem> examples;
    ImageButton viewcart;
    TextView txtuser;

    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_history);
    }
}
```

```

txtuser=findViewById(R.id.textAuthorSign);
final String username = getIntent().getStringExtra("username");
txtuser.setText(username);

this.Searchtext = (EditText) findViewById(R.id.search_input);
this.Searchtext.addTextChangedListener(new TextWatcher() {
    public void beforeTextChanged(CharSequence charSequence,
        int i, int i1, int i2) {
    }

    public void onTextChanged(CharSequence charSequence, int i,
        int i1, int i2) {
    }

    public void afterTextChanged(Editable editable) {
        filterQuery(editable.toString());
    }
});

fillExampleList();

initToolbar();
}

private void fillExampleList() {
    exampleList = new ArrayList();

    try {
        JSONArray jsonArray = new
            JSONArray(getIntent().getStringExtra("username"));
        for (int i = 0; i < jsonArray.length(); i++) {
            String name =
                String.valueOf(jsonArray.getJSONArray(i).getString(1));
            String test =
                String.valueOf(jsonArray.getJSONArray(i).getString(2));
            String age =
                String.valueOf(jsonArray.getJSONArray(i).getString(3));

            exampleList.add(new ExampleItem(name,test,age));

        }
    } catch (JSONException e) {
        e.printStackTrace();
    }
}

```



```

    }

    setUpRecyclerView();
}

private void setUpRecyclerView() {
    RecyclerView recyclerView = (RecyclerView) findViewById(
        R.id.rv);
    recyclerView.setHasFixedSize(true);
    RecyclerView.LayoutManager layoutManager = new
        LinearLayoutManager(this);
    this.adapter = new
        ExampleAdapter(exampleList, getApplicationContext());
    recyclerView.setLayoutManager(layoutManager);
    recyclerView.setAdapter(this.adapter);
}

private void initToolBar() {
    //      setSupportActionBar((ToolBar) findViewById( R.id.toolbar));
    //      getSupportActionBar().setTitle((CharSequence) "Filter
Activity");
    // getSupportActionBar().setDisplayHomeAsUpEnabled(true);
}

public void filterQuery(String text) {
    ArrayList<ExampleItem> filterdNames = new ArrayList<>();
    for (ExampleItem s : exampleList) {
        if (s.getText1().toLowerCase().contains(text) ||
            s.getText2().toLowerCase().contains(text)) {
            filterdNames.add(s);
        }
    }

    this.adapter.setFilter(filterdNames);
}

private static String buildSanitizedRequest(String url, Map<String,
String> mapOfStrings) {

    Uri.Builder uriBuilder = new Uri.Builder();
    uriBuilder.encodePath(url);
    if (mapOfStrings != null) {
        for (Map.Entry<String, String> entry :
            mapOfStrings.entrySet()) {
            Log.d("buildSanitizedRequest", "key: " + entry.getKey()
                + " value: " + entry.getValue());
            uriBuilder.appendQueryParameter(entry.getKey(),
                entry.getValue());
        }
    }

    String uriString;
    try {

```

```

        uriString = uriBuilder.build().toString(); // May throw an
        // UnsupportedOperationException
    } catch (Exception e) {
        Log.e("Exception", "Exception" + e);
    }

    return uriBuilder.build().toString();

}

public class HttpGetRequest extends AsyncTask<String, Void, String> {
    public static final String REQUEST_METHOD = "POST";
    public static final int READ_TIMEOUT = 15000;
    public static final int CONNECTION_TIMEOUT = 15000;

    @Override
    protected String doInBackground(String... params){

        String urlString = params[0];
        String result;
        String inputLine;
        try {
            //Create a URL object holding our url
            URL myUrl = new URL(urlString);
            //Create a connection
            HttpURLConnection connection =(HttpURLConnection)
                myUrl.openConnection();
            //Set methods and timeouts
            connection.setRequestMethod(REQUEST_METHOD);
            connection.setReadTimeout(READ_TIMEOUT);
            connection.setConnectTimeout(CONNECTION_TIMEOUT);

            //Connect to our url
            connection.connect();
            //Create a new InputStreamReader
            InputStreamReader streamReader = new
            InputStreamReader(connection.getInputStream());
            //Create a new buffered reader and String Builder
            BufferedReader reader = new
            BufferedReader(streamReader);
            StringBuilder stringBuilder = new StringBuilder();
            //Check if the line we are reading is not null
            while((inputLine = reader.readLine()) != null){
                stringBuilder.append(inputLine);
            }
            //Close our InputStream and Buffered reader
            reader.close();

```

```

        streamReader.close();
        //Set our result equal to our stringBuilder
        result = stringBuilder.toString();
    }
    catch(IOException e){
        e.printStackTrace();
        result = null;
    }
    return result;
}
@Override
protected void onPostExecute(String result){
    super.onPostExecute(result);
    //        if(prDialog!=null) {
    //            prDialog.dismiss();
    //        }
}
}

```

- Add Test.java

```
package com.baecon.covid19;

import androidx.appcompat.app.AppCompatActivity;

import android.content.Intent;
import android.os.Bundle;
import android.os.StrictMode;
import android.view.View;
import android.widget.Button;
import android.widget.EditText;
import android.widget.TextView;
import android.widget.Toast;

import org.apache.http.NameValuePair;
import org.apache.http.message.BasicNameValuePair;
import org.json.JSONException;

import java.util.ArrayList;
import java.util.List;

public class addtest extends AppCompatActivity {

    EditText edit1,edit2,edit3,edit4;
    Button btn;
    TextView txtuser;

    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_addtest);

        txtuser=findViewById(R.id.textAuthorSign);
        final String username = getIntent().getStringExtra("username");
        txtuser.setText(username);

        edit1=findViewById(R.id.tname);
        edit2=findViewById(R.id.sym);
        edit3=findViewById(R.id.age);
        edit4=findViewById(R.id.gender);
        btn=findViewById(R.id.addtest);
        btn.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View view) {
```

```

String testname = edit1.getText().toString();
String sname = edit2.getText().toString();
String age = edit3.getText().toString();
String gender = edit4.getText().toString();

if(testname.equals("")||sname.equals("")||
age.equals("")||gender.equals("")){
    Toast.makeText(addtest.this, "Please enter username
    or password or mobile number or email",
    Toast.LENGTH_SHORT).show();
}
else {
    StrictMode.ThreadPolicy policy = new
    StrictMode.ThreadPolicy.Builder().permitAll().build();
    StrictMode.setThreadPolicy(policy);
    String url = UrlLinks.addtest;

    List<NameValuePair> nameValuePairs = new
    ArrayList<NameValuePair>(4);

    nameValuePairs.add(new
    BasicNameValuePair("testname", testname));
    nameValuePairs.add(new BasicNameValuePair("sname",
    sname));
    nameValuePairs.add(new BasicNameValuePair("age",
    age));
    nameValuePairs.add(new BasicNameValuePair("gender",
    gender));
    nameValuePairs.add(new
    BasicNameValuePair("username", username));

    String result = null;
    try {
        result =
        jSONClassforData.forCallingStringAndreturnString(
        url,nameValuePairs);
    } catch (JSONException e) {
        e.printStackTrace();
    }

    if (result.equals("success")) {

        Toast.makeText(addtest.this, "Test Added
        Successfully", Toast.LENGTH_SHORT).show();
    }
}

```

```
        } else {  
            Toast.makeText(addtest.this, "Test Not Add",  
                Toast.LENGTH_SHORT).show();  
        }  
    }  
}  
});  
}  
}
```

- **UrlLinks.java**

```
package com.baecon.covid19;

public class UrlLinks {

    // public static String urlserver="https://
    communicationfeedback.herokuapp.com/";
    // public static String urlserver="http://192.168.0.105:5000/";
    // public static String checklogin=urlserver+"login";

    // public static String checkregistration=urlserver+"userRegister";

    public static String urlserverpython="http://192.168.0.105:5000/";

    public static String pyregister=urlserverpython+"userRegister";
    public static String pylogin=urlserverpython+"userLogin";
    public static String addtest=urlserverpython+"addtest";

    public static String fanState=urlserverpython+"getState";
    public static String fanState1=urlserverpython+"history";
    public static String fanState2=urlserverpython+"deletetest";

    public static String
    fanforgotpass=urlserverpython+"forgotpassword";

    /*public static String checklogin=urlserver+"Login";
    public static String checkregistration=urlserver+"registration";
    public static String forgotpassword=urlserver+"forgotpass";
    public static String checkupdate=urlserver+"searchview";
    public static String loadDoctorData=urlserver+"searchrestaurants";
    public static String payment=urlserver+"payment";
    public static String passwordreset=urlserver+"passwordreset";
    public static String
    loadPatientImagedetails=urlserver+"loadPatientImagedetails";
    public static String
    sendfiletoServer=urlserver+"GetDataOflostChildrenFromuser";
    public static String loadDoctorData1=urlserver+"markerinformation";
    public static String offersdetails=urlserver+"ouroffers";
    public static String offersmobilenos=urlserver+"mobilenos";
    public static String offersremovebutton=urlserver+"removecart";
```

```
public static String ViewCart=urlserver+"Viewcart";  
public static String addtocart=urlserver+"addtocart";  
public static String  
forgotpasswordnew=urlserver+"forgotpassword";*/
```

```
}
```



# Chapter 5

## Testing

### 5.1 Unit Testing

Unit testing is the testing of an individual unit of a software at the code level are functional and work as they were designed to. Unit testing will also make debugging easier because finding issues earlier means they take time to fix than if they were discovered later in the testing process.

The Unit testing is best suited for our application development phase. In that phase, we started to code in units create different modules. And test each module separately, like the login page, register page, home page, contacts page, add test page, test result page, etc. All these pages are tested and debugged before going further integrating. And check whether we are getting the desired output from each module as for the objectives.

### 5.2 Integration Testing

After each unit is thoroughly tested, it is integrated with other units to create modules or components that are designed to perform specific tasks or activities. These are then tested as group through integration testing to ensure whole segments of an application behave as expected.

As we have discussed unit testing the next step is integration testing. All the units which we have tested and debugged are now ready to integrate into a whole single module. The integration part is crucial as we need to know which unit must interact without error, calling them in a different class accessing the instance of that class all these can be cleared with help of the sequence diagram which was represented in Project Design. So accordingly, modules are integrated and checked whether they behave as for the objectives.

# Chapter 6

## Result

### 6.1 Software

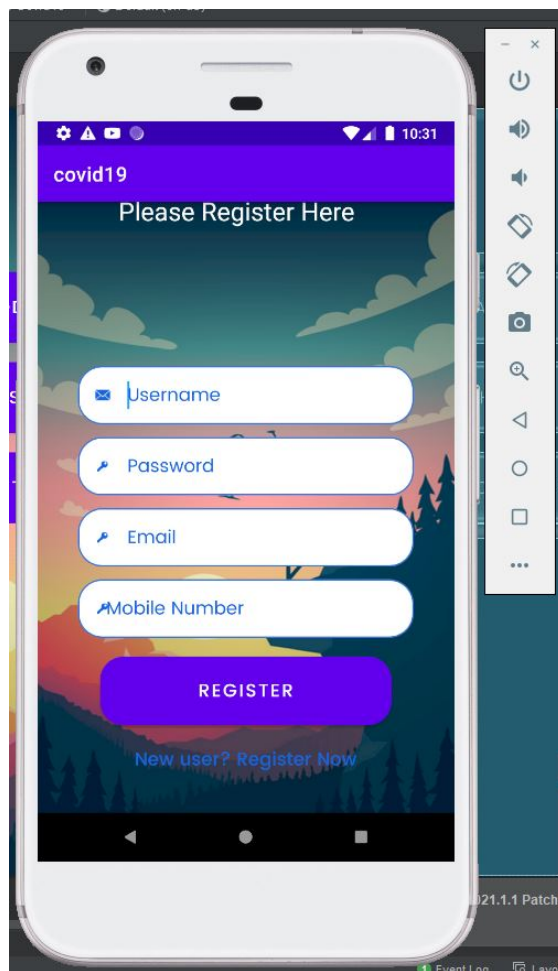


Figure 6.1: Registration

This page will ask for details of user which are User name, Password, Email and Mobile Number from the user who will be registering for the first time.

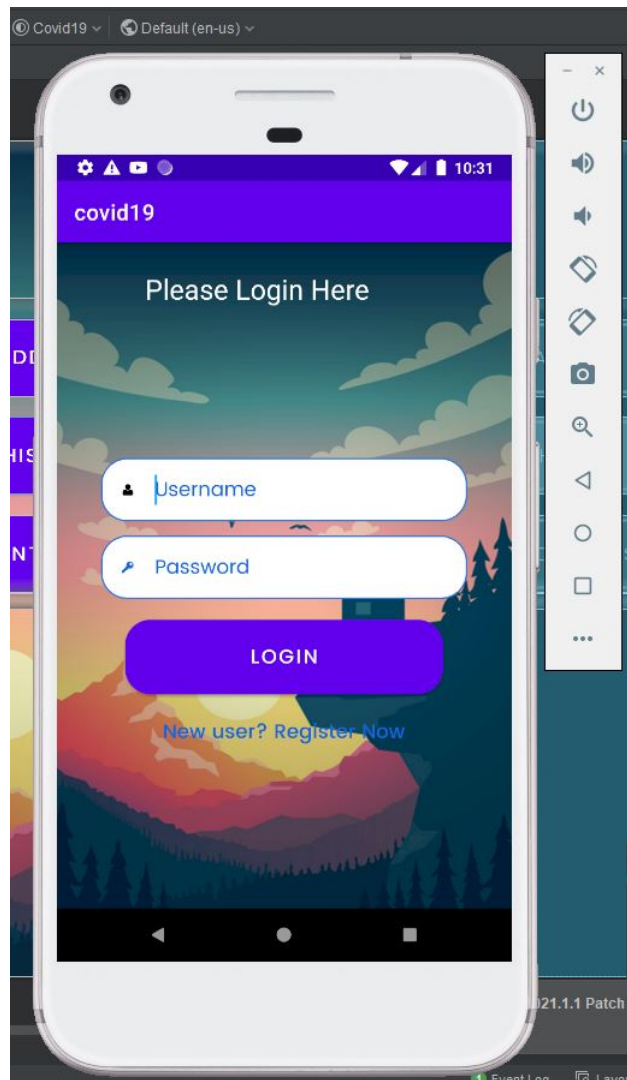


Figure 6.2: Login

The Login Page will ask for the user credentials that are User name and Password.

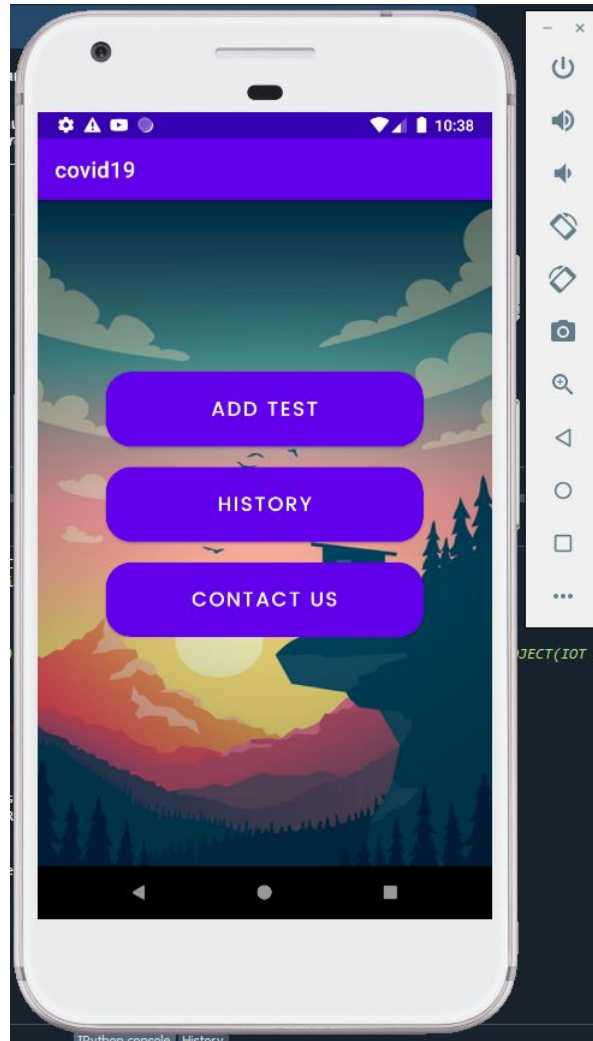


Figure 6.3: Home

The Home Page will be showing 3 options that are Add Test, History and Contact Us. User can select one of the three option as per his/her requirement.

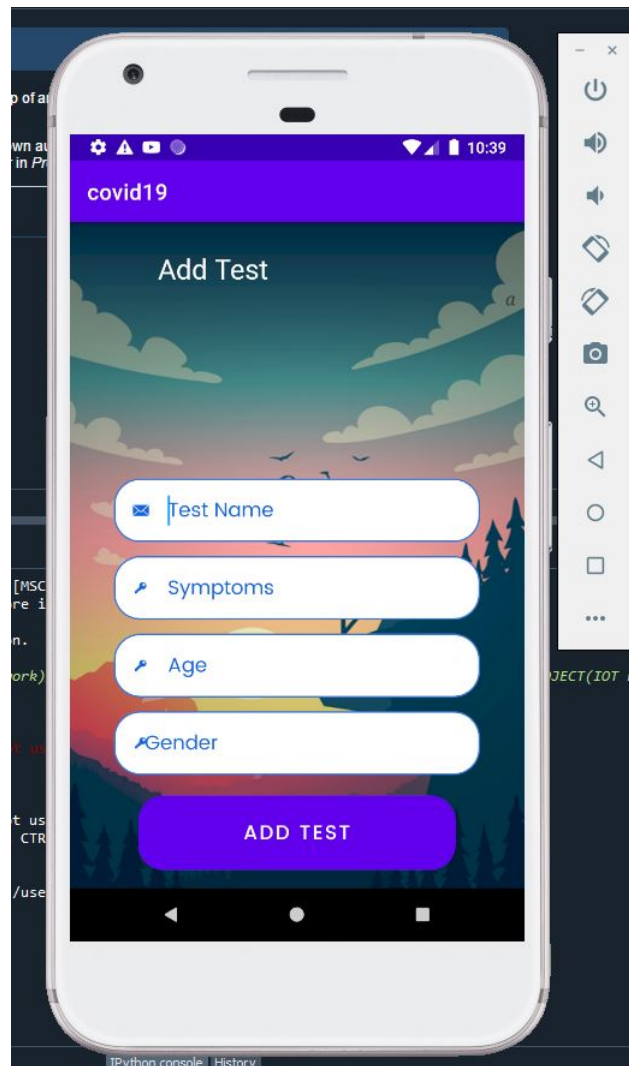


Figure 6.4: Add Test

Add Test page will be displayed once the user has clicked the Add Test button from the Home Page. Add Test Page contains Test Name, Symptoms, Age and Gender. User need to fill all these details and then click on the Add Test button.

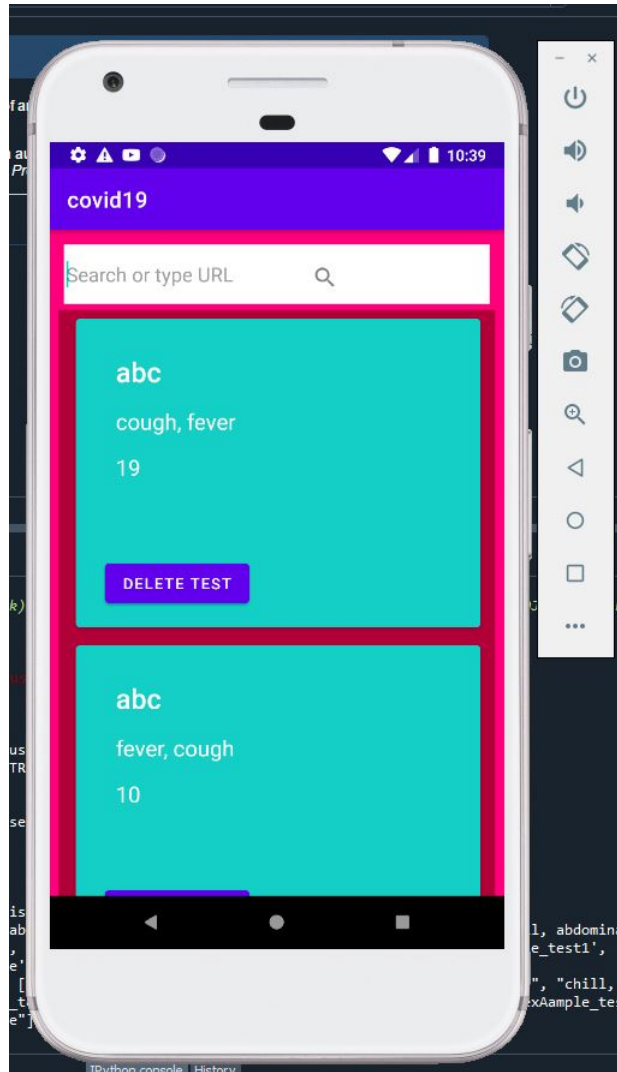


Figure 6.5: History

History page will be displayed once the user has clicked the History button from the Home Page. If the user has taken the test then the test details will be shown in the History page. If the user haven't taken any test then it will show zero record history. User can take multiple test and all the test history will be shown in the History Page.

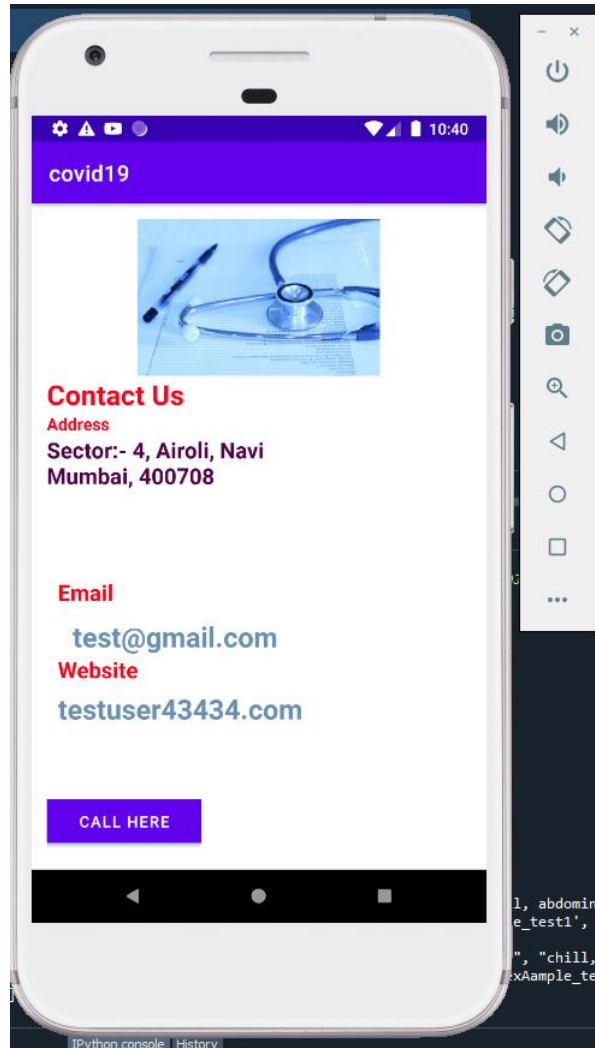


Figure 6.6: Contact Us

Contact Us page will be displayed once the user has clicked the Contact Us button from the Home Page. Contact Us page will give all the details such as Address, Email, Website for clearing any queries they have.

Vital test Username:

Oxygen saturation level should be seen in your mobile and enter  
:

Temperature :0

Heart pulse rate :0

Vital test Username:

Figure 6.7: Vitals Capturing Site

Vitals Capturing Site will show the Body temperature and Heart pulse rate also it displays the cough rate which is detected by the Hardware Device when in used. After clicking on submit the records will be stored and shown on the main website.



## 6.2 Hardware

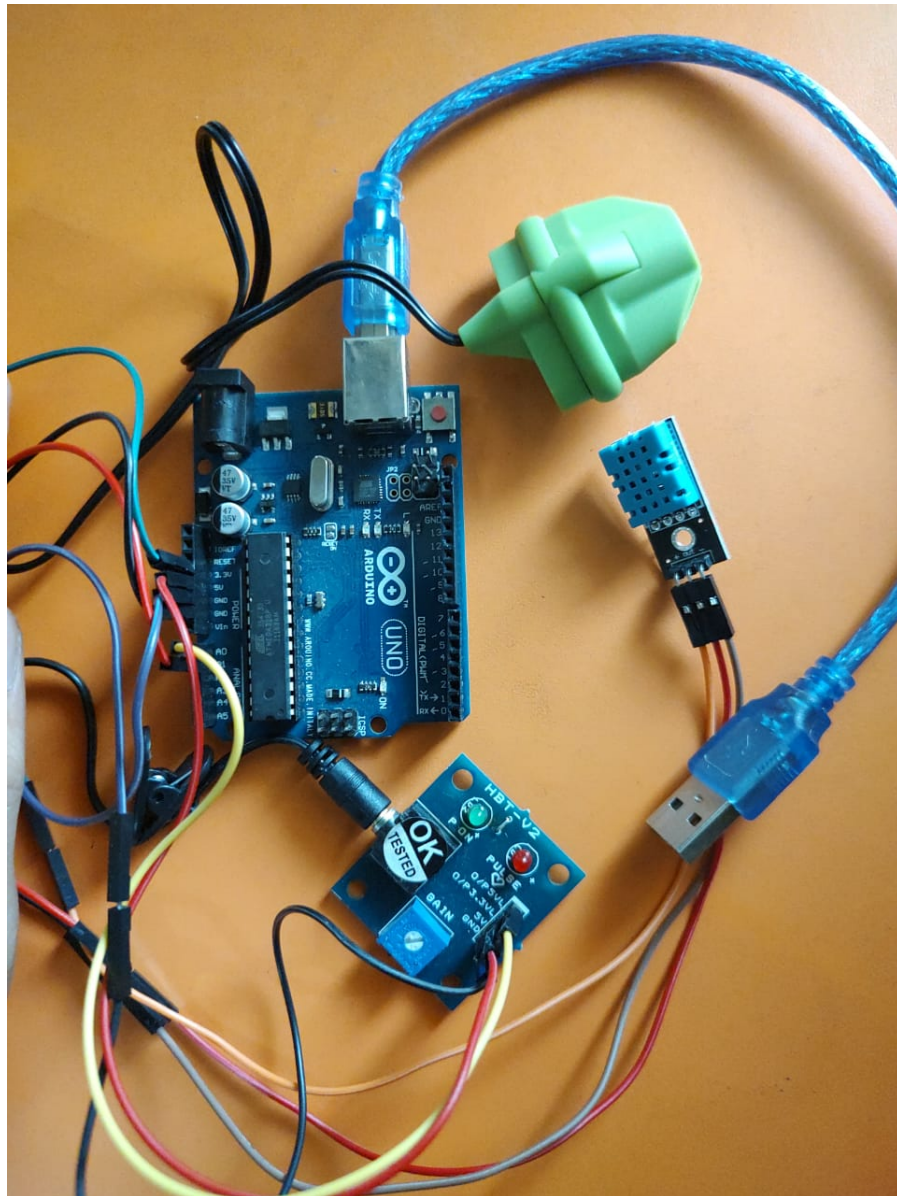


Figure 6.8: Hardware Device

Hardware Device is used to measure the Body temperature, Heart pulse rate and cough rate and then the data is shown on the server site.

# Chapter 7

## Conclusions and Future Scope

The COVID19 virus has been around for almost a year and the medical community, Scientists and researchers are doing their best to identify a cure for the diseases. At the same time, people all over the world are facing problems in determining the status of an individual who is healthy or affected by the virus. Cutting-edge solutions require a visit to a hospital or healthcare facility to perform the COVID19 diagnosis. Given the many difficulties and dangers associated with its diagnosis, it is preferable to be able to detect the disease using portable devices. This article has proposed a framework for the remote screening of the virus using the standard practice identified in the literature. The framework uses sensors made in the form of a wearable device that can be worn by any individual to know in seconds whether the person is healthy or whether they are in doubt to be affected by the disease. The framework requires testing on a large population and, at the same time, the data obtained from the tests can be used for advanced analyzes such as epidemic forecasting and prevention, population segmentation, as well as to assist the government. and policymakers to take appropriate action. As part of future work, and due to the unavailability of requested data, we will test our device using the data to determine its performance.

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# Publication

Paper entitled **“An IOT based framework for Statistical Analysis and Screening of Covid-19”** is selected and presented at **“Third International Conference on Internet of Things organized by SRM Institute of Science and Technology ICIoT-2022”** which is a Springer Paper by **“Pratik Gholap, Apoorva Gadkari, Priyanka Walekar”**.

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