COSECURE

A PROJECTREPORT SUBMITTED TO

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(An Autonomous Institute under VTU, Belagavi)

In partial fulfillment of the requirements for Project work (Minor Project CS6C06), sixth semester

Bachelor of Engineering

in

Computer Science and Engineering

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THE NATIONAL INSTITUTE OF ENGINEERING

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

THE NATIONAL INSTITUTE OF ENGINEERING

CERTIFICATE

This is to certify that the project work entitled **CoSecure** is a work carried out by **Koushik Reddy N (4NI18CS032), Prahlada (4NI18CS052) and Rajkumar (4NI18CS058)** in partial fulfillment for the project work (Minor Project -CS6C06), sixth semester, Computer Science & Engineering, The National Institute of Engineering **(**Autonomous Institution under Visvesvaraya Technological University, Belagavi)during the academic year 2020-2021. It is certified that all corrections and suggestions indicated for the Internal Assessment have been incorporated in the report deposited in the department library. The project work report has been approved in partial fulfillment as per academic regulations of The National Institute of Engineering, Mysuru.

Signature of the Guides

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Signature of the HoD

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We as a team declare that we have implemented most of the concepts which are taught in our class and we clearly understood all the concepts which are implemented in our project. And we hereby declare that we haven't done any malpractice and declare that we have done the best for our project.

- Koushik Reddy N

- Prahlada

-Rajkumar R

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Chapter 1

Introduction

Since COVID pandemic is again getting peak and uncontrollable, people are not confirm with their symptoms against covid-19 virus, so we across an idea of predicting the user's covid-19 virus attack based on their body temperature, beats per minute, spO2 level, taste sensitive, sneeze, headache, throat soar, cough and if they contacted with covid-19 positive patient. We will inform the user the changes that he/she is effected based on the previous data of covid-19 patients.

CoSecure has two type of users, one is users who want to test their symptoms and another type of user are doctors who can be consulted based on the symptoms.

CoSecure is Application where user can login and check their chances of covid-19 virus attack based on the body situation. We will take the user data of body temperature, beats per minute, spO2 level, taste sensitive, sneeze, headache, throat soar, cough and if they contacted with covid-19 positive patient. And then we inform the user the chances of virus affected. The prediction is purely based on Machine Learning model that is trained based on the covid-19 test reports of thousands users. If the chances of the user is really high then user can consult the doctor via chat in our application.

Most common symptoms:

- fever
- dry cough
- tiredness

Less common symptoms:

- aches and pains
- sore throat
- diarrhoea
- conjunctivitis
- headache
- loss of taste or smell
- a rash on skin, or discolouration of fingers or toes

Serious symptoms:

- difficulty breathing or shortness of breath
- chest pain or pressure
- loss of speech or movement

. We will take the user data of body temperature, beats per minute, spO2 level, taste sensitive, sneeze, headache, throat soar, cough and if they contacted with covid-19 positive patient. And then we inform the user the chances of virus affected. The prediction is purely based on Machine Learning model that is trained based on the covid-19 test reports of thousands users. If the chances of the user is really high then user can consult the doctor via chat in our application.

These features makes or application unique with other Technologies in market.

Chapter 2

System Analysis

EXISTING SYSTEM

Aarogya Setu is an Indian COVID–19 "contact tracing, syndromic mapping and self-assessment" digital service, primarily a mobile app, developed by the National Informatics Centre under the Ministry of Electronics and Information Technology. The app reached more than 100 million installs in 40 days.

Figure 2.1: Aarogya Setu

If you make a first or a second degree contact with a COVID-19 positive person, Aarogya Setu alerts you and gets you timely medical help. The self-assessment test also helps you in identifying possibilities of infection

By early identification and prevention of potential risk of infection in you and others, Aarogya Setu enables better safety for those around you, acting as a shield of protection for all your loved ones.

The app helps the Govt. of India identify hotspots, hence aiding in curbing the spread of the infection. The more number of people use it, the more effective the app will be in chaining the pandemic.

PROPOSED SYTEM

We will take the user data of body temperature, beats per minute, spO2 level, taste sensitive, sneeze, headache, throat soar, cough and if they contacted with covid-19 positive patient. And then we inform the user the chances of virus affected. The prediction is purely based on Machine Learning model that is trained based on the covid-19 test reports of thousands users. If the chances of the user is really high then user can consult the doctor via chat in our application.

Features on CoSecure are:

- User can test their Covid-19 prediction via the machine learning model trained over millions of dataset reports
- Users can add their Covid-19 test report
- Admin can change the dataset
- Admin can download the dataset which was filled by users
- Admin can view the dataset filled by users

SYTEM REQUIREMENTS:

Our application can be used by anyone and it is accessible anywhere around the world wide, what they need is a device, a browser and an internet connection.

Chapter 3

System Design

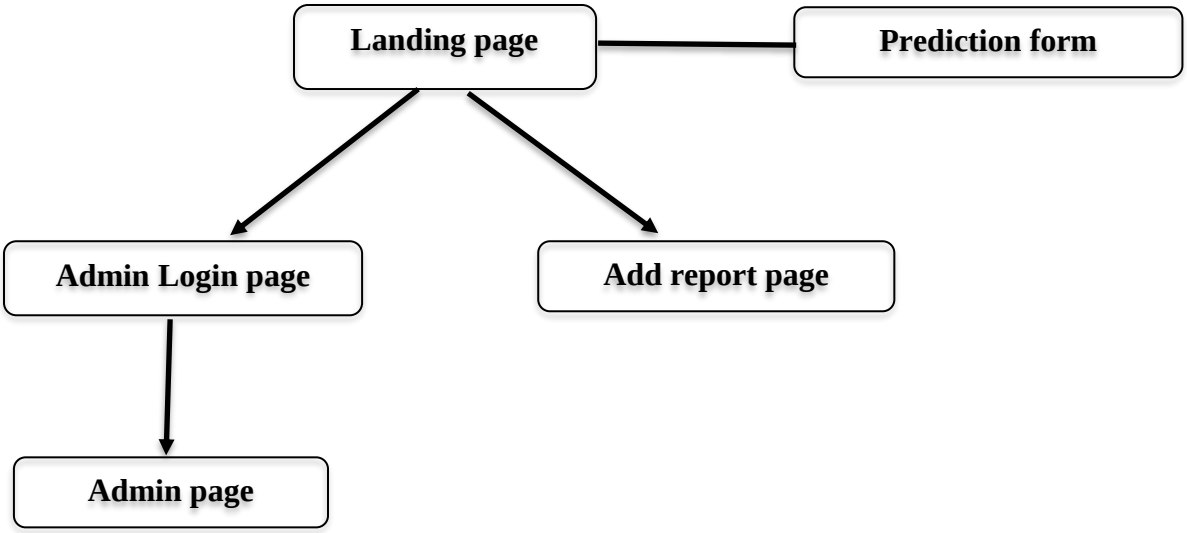

Figure 3.1: Hierarchical of Application

The application contains the page as follows

- Landing page where all the prediction form about CoSecure and help or contact developer content are specified
- The Second page is Admin login page where the admin can login
- The another page is admin page where he can see all the activity of users and he can change the dataset nd attribute factor and can download the dataset in csv format
- Add report page is the page where user can enter their covid-19 test report

ER DIAGRAM

We will take the user data of body temperature, beats per minute, spO2 level, taste sensitive, sneeze, headache, throat soar, cough and if they contacted with covid-19 positive patient. And then we inform the user the chances of virus affected.

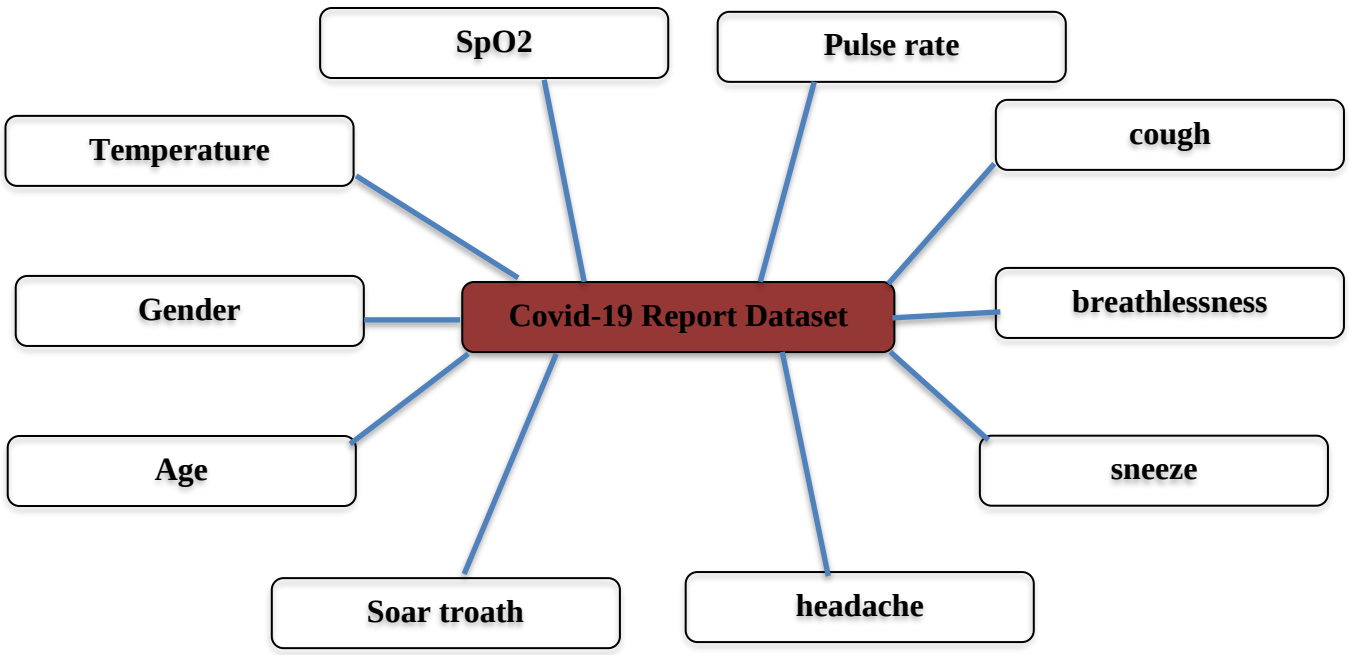

Figure 3.2: ER Diagram

Chapter 4

System Implementation

Our Application was implemented using REST API (Representational state transfer), which is an architectural style for providing standards between computer systems on the web, making it easier for systems to communicate with each other.

REST-compliant systems, often called RESTful systems, are characterized by how they are stateless and separate the concerns of client and server. In the REST architectural style, the implementation of the client and the implementation of the server can be done independently without each knowing about the other. This means that the code on the client side can be changed at any time without affecting the operation of the server, and the code on the server side can be changed without affecting the operation of the client.

Systems that follow the REST paradigm are stateless, meaning that the server does not need to know anything about what state the client is in and vice versa. In this way, both the server and the client can understand any message received, even without seeing previous messages.

This constraint of statelessness is enforced through the use of resources, rather than commands. Resources are the nouns of the Web - they describe any object, document, or thing that you may need to store or send to other services.

Because REST systems interact through standard operations on resources, they do not rely on the implementation of interfaces. They are connected via request and response operations which will using JSON (JavaScript Object Notation) request and response.

The implementation of our REST API is as follows with the MVC Model. In the below figure 4.1 the MVC model of our application are shown which is the same as the standards which are maintained by many company

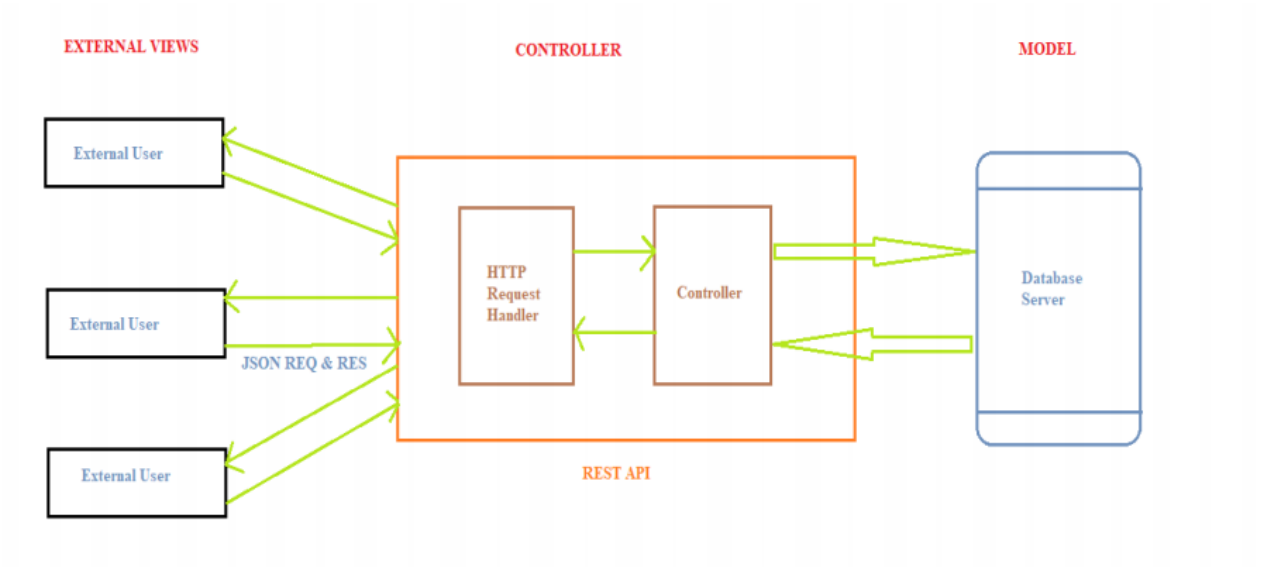

Figure 4.1: MVC model of REST API

The **Model-View-Controller (MVC)** is an architectural pattern that separates an application into three main logical components: the model, the view, and the controller. Each of these components are built to handle specific development aspects of an application. MVC is one of the most frequently used industry-standard web development framework to create scalable and extensible projects.

The Model component corresponds to all the data-related logic that the user works with. This can represent either the data that is being transferred between the View and Controller components or any other business logic-related data. For example, a Customer object will retrieve the customer information from the database, manipulate it and update it data back to the database or use it to render data.

The View component is used for all the UI logic of the application. For example, the Customer view will include all the UI components such as text boxes, dropdowns, etc. that the final user interacts with.

Controllers act as an interface between Model and View components to process all the business logic and incoming requests, manipulate data using the Model component and interact with the Views to render the final output. For example, the Customer controller will handle all the interactions and inputs from the Customer View and update the database using the Customer Model. The same controller will be used to view the Customer data.

Advantages of using MVC models are

- ϖ Faster Development process
- ϖ Ability to provide multiple views
- ϖ Supports asynchronous functions

ϖ Modification doesn't affect the entire model

ϖ It returns data without formatting ϖ SEO friendly

Advantages of using REST API are

⎪ Client Server Architecture

⎪ Stateless

⎪ Cacheable

⎪ Simplicity

⎪ Independent functionality of frontend and backend

⎪ Uniform interface

The some of the tools which we used during development are integrated development environment (IDE) like Atom and Visual Studio Code, GIT which is a distributed version-control system for tracking changes in any set of files, Chrome Development and Debugging Tools which is used for finding bugs in code and developing, Django rest Authentication tool for authentication, Django REST Framework for creating REST API, Canvas JS for plotting graphs of data points, amChart for creating vertical bar graph for prediction, bootstrap and materialize css for trivial styling, postman for testing API request and response.

An IDE, or Integrated Development Environment, enables programmers to consolidate the different aspects of writing a computer program.

IDEs increase programmer productivity by combining common activities of writing software into a single application: editing source code, building executable, and debugging.

An IDE that knows the syntax of our language can provide visual cues. Keywords, words that have special meaning like class in python, JavaScript and others are highlighted with different P a g e 17 | 35 colors. Syntax highlighting makes code easier to read by visually clarifying different elements of language syntax

When the IDE knows your programming language, it can anticipate what you're going to type next, it has auto complete and auto fill which will be helping in saving developer's time. IDEs also provide hints while coding to prevent errors before compilation.

No programmer avoids writing bugs and programs with errors. When a program does not run correctly, IDEs provide debugging tools that allow programmers to examine different variables and inspect their code in a deliberate way

Git is a version-control system for tracking changes in computer files and coordinating work on those files among multiple people. Git is a Distributed Version Control System. So Git does not necessarily rely on a central server to store all the versions of a project's files. Instead, every user "clones" a copy of a repository (a collection of files) and has the full history of the project on their own hard drive. This clone has all of the metadata of the original while the original itself is stored on a self-hosted server or a third party hosting service like GitHub.

Git helps you keep track of the changes you make to your code. It is basically the history tab for your code editor. If at any point while coding you hit a fatal error and don't know what's causing it you can always revert back to the stable state. So it is very helpful for debugging. Or you can simply see what changes you made to your code over time

Real life projects generally have multiple developers working in parallel. So a version control system like Git is needed to ensure there are no code conflicts between the developers. Additionally, the requirements in such projects change often. So a version control system allows developers to revert and go back to an older version of the code.

Finally, sometimes several projects like our project which are being run in parallel involve the same codebase. In such a case, the concept of branching in Git is very important.

Web development tools (often called devtools) allow web developers to test and debug their code. They are different from website builders and integrated development environments (IDEs) in that they do not assist in the direct creation of a webpage, rather they are tools used for testing the user interface of a website or web application.

Web development tools come as browser add-ons or built-in features in web browsers. Most popular web browsers, such as Google Chrome, Firefox, Internet P a g e 18 | 35 Explorer, Safari and Opera, [1] have built-in tools to help web developers, and many additional add-ons can be found in their respective plugin download centers.

Web development tools allow developers to work with a variety of web technologies, including HTML, CSS, the DOM, JavaScript, and other components that are handled by the web browser. Due to increasing demand from web browsers to do more,[2] popular web browsers have included more features geared for developers.

Using APIs on a daily basis might become cumbersome, as one might have dozens or even hundreds of APIs that he or she needs to use or test. That makes it difficult to keep up with their exact request's address, header, and authorization credential(s) etc., and by that make it harder to test the API for functionality, security and exception handling. Postman is a popular API client that makes it easy for developers to create, share, test and document APIs. This is done by allowing users to create and save simple and complex HTTP/s requests, as well as read their responses. The result - more efficient and less tedious work

Postman is very convenient when it comes to executing APIs. Once you've entered and saved them, you can simply use them over and over again, without having to remember the exact endpoint, headers, API keys, etc.

Django REST framework is a powerful and flexible toolkit for building Web APIs.

Some reasons for REST framework:

- The Web browsable API is a huge usability win for your developers.
- Authentication policies including packages for rest auth.
- Serialization that supports both ORM and non-ORM data sources.
- Customizable all the way down - just use regular function-based views if you don't need the more powerful features.
- Extensive documentation, and great community support.
- Used and trusted by internationally recognised companies including Mozilla, Red Hat, Heroku, and Eventbrite

Django apps have been able to serve up app-level REST API endpoints. As a result, we saw a lot of instances where developers implemented their own REST registration API endpoints here and there, snippets, and so on. We aim to solve this demand by providing django-rest-auth, a set of REST API endpoints to handle User Registration and Authentication tasks. By having these P a g e 19 | 35 API endpoints, your client apps such as AngularJS, iOS, Android, and others can communicate to your Django backend site independently via REST APIs for User Management. Of course, we'll add more API endpoints as we see the demand.

CanvasJS supports 30 different types of Charts and renders across devices including iPhone, iPad, Android, Mac & PCs. This allows you to create rich dashboards that work across devices without

compromising on maintainability or functionality of your web application. Graphs include several good looking themes and are 10x faster than conventional Flash / SVG based Charting Libraries – resulting in lightweight, beautiful and responsive dashboards. CanvasJS can render 100,000 Data-Points in just a few hundred milliseconds! A perfect fit if you are looking for High Performance HTML5 Charting Library.

Bootstrap and materialize css are framework to help you design websites faster and easier. It includes HTML and CSS based design templates for typography, forms, buttons, tables, navigation, modals, image carousels, etc. It also gives you support for JavaScript plugins. It will save most of the time for developers instead of doing it from scratch which consumes time that is inefficient

A virtual environment is a tool that helps to keep dependencies required by different projects separate by creating isolated python virtual environments for them. This is one of the most important tools that most of the Python developers use. Imagine a scenario where you are working on two web based python projects and one of them uses a Django 1.9 and the other uses Django 1.10 and so on. In such situations virtual environment can be really useful to maintain dependencies of both the projects.

Virtual Environment should be used whenever you work on any Python based project. It is generally good to have one new virtual environment for every Python based project you work on. So the dependencies of every project are isolated from the system and each other.

Heroku is a container-based cloud Platform as a Service (PaaS). Developers use Heroku to deploy, manage, and scale modern apps. Our platform is elegant, flexible, and easy to use, offering developers the simplest path to getting their apps to market.

Heroku is fully managed, giving developers the freedom to focus on their core product without the distraction of maintaining servers, hardware, or infrastructure. The Heroku experience provides services, tools, workflows, and polyglot support—all designed to enhance developer productivity.

GitHub, Inc. is a subsidiary of Microsoft which provides hosting for software development and version control using Git. It offers the distributed version control and source code management (SCM) functionality of Git, plus its own features. It provides access control and several collaboration features such as bug tracking, feature requests, task management, continuous integration and wikis for every project. GitHub offers its basic services free of charge. Its more advanced professional and enterprise services are commercial. Free GitHub accounts are commonly used to host open-source projects.

In addition, you can reduce the file size of a gif, resize a gif, reverse a gif, merge / join two or more gifs into one gif online, or split a gif into separate frames. After you created a gif, you can crop, resize, rotate and compress this animated gif file (or any other JPEG, PNG and BMP images) at ResizeImage.net,

you can even remove the background from an image to make it transparent! This animation maker works on Windows, Mac and Linux, the only thing you need is a Web browser with flash player installed.

JPEG-Optimizer is a free online tool for resizing and compressing your digital photos and images for displaying on the web in forums or blogs, or for sending by email. Completely Free. No software to download.

Chapter 5

System Testing

To ensure the System is free of bugs and working as required by end user, extensive testing is done with variety of test cases.

With Purpose of not only verifying or proving that the system works, project is done thinking of how it might fail.

From systematic coding itself, functional bugs, GUI bugs, data base related bugs are ruled out. Errors related to browser compatibility is made scarce by coding the system to work with fluidity in updated browsers, proper error handling is carried out and minor syntax errors, calculation errors, data type mismatch like coding errors are eliminated.

Expecting to design system free of errors, "constraints" are assigned properly with error modal displaying on invalid inputs or a model notifying if form is submitted if all the fields are filled accordingly.

Major examples of testing:

When we login through the username or password which is invalid, it will inform the end user that the credentials doesn’t exist and prompt again to enter correct login credentials.

We cannot add the team which is already existing in the respective IPL seasons. Add we cannot add players to the team name which is not present in the IPL seasons, Likewise we cannot add match for non-existing team in IPL season

When the match between two teams was tie, previously designed system couldn't verify winner. This was fixed by declaring winner (maybe by super over), which will be directly considered.

For all input fields like overs taken field: Maximum overs being 20 and minimum being 0. Likewise team score is not negative, and we cannot enter negative score in the form.

Wrong declaration of winner in winner field example if first team score is greater than second team score and if we declare winner as second team then it will give form data error.

Generally testing is carried in two/three levels, Unit Testing, Integration Testing and Functionality Testing, we followed the same approach in our project.

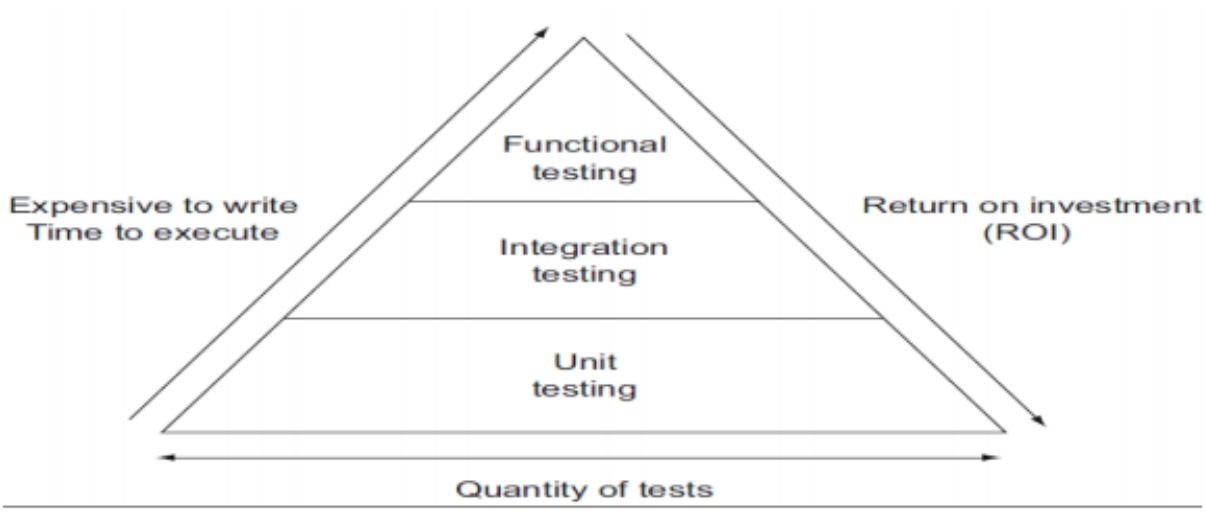

Figure 5.1: Hierarchical view of Testing

In the above figure 5.1, it shows the hierarchical view of testing of our application to maintain the standards of development as shown in the figure 5.1 figure.

Modules related to authentication including login and sign-up, data base presentation with season, matches, points table, and home page and machine learning predictor bar graph etc.

We also tested all the functions and class of both frontend and backend whether they are working perfectly with test case to check whether functions are giving the desired outcomes.

Integration testing: With unit testing proving robust, integrated testing is done so that IPL database is accessible without a hitch throughout the browsing process.

I.e. each unit like login / sign page, home page, points table page etc. And tables like season, points table, and matches table all work in sync to provide desired performance with no bugs.

Functionality testing: In this testing unit we tested whether all the functionality of the application are clearly satisfied. We checked all the functionality that we have planned of doing and we successfully fulfilled all the functionality of the system requirement.

Error handing is done in ways where residuals defects and garbage code is eliminated.

With range testing of handling of invalid input values and display them and by Considering boundary values and corner cases in testing other than middle road values fully functional system is designed in best possible way.

Sample test case for login:

Title: Login Page – Authenticate Successfully on IPL database website

Description: A registered user should be able to successfully login to IPL database website.

Precondition: the user must already be registered with an email address.

Assumption: a supported browser is being used with system having internet access.

If all the test case pass with desired outcome, then the test case is considered to be passed successfully.

Chapter 6

Results

HOME PAGE

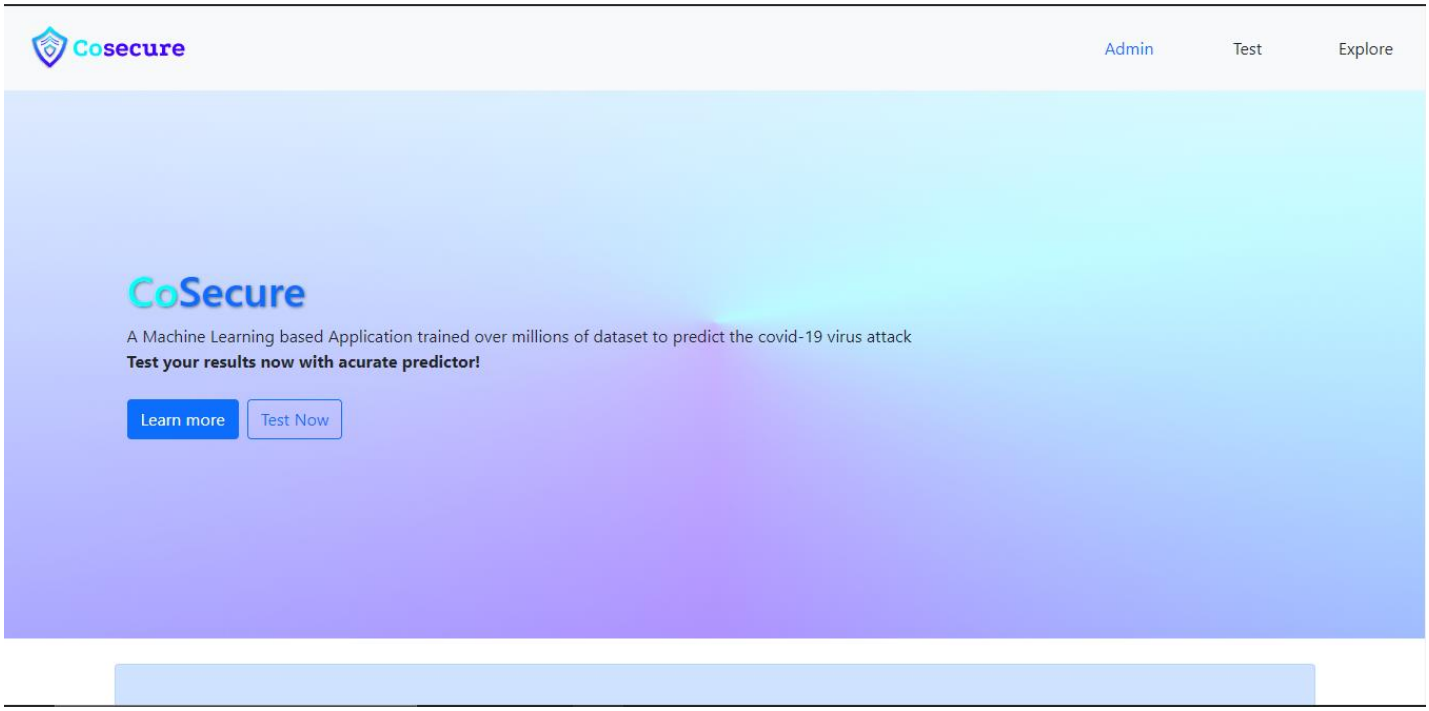

Figure 6.1: Landing page

This is the home or landing page of the application with the following contents of learn more about the application and the try now feature of the application.

- Learn more option will lead to link for about page content
- Try now will lead to form for covid-19 predictor
- Admin page will lead to Admin login page
- Explore will lead to more info part of the page
- Test will lead to predictor

ABOUT PAGE

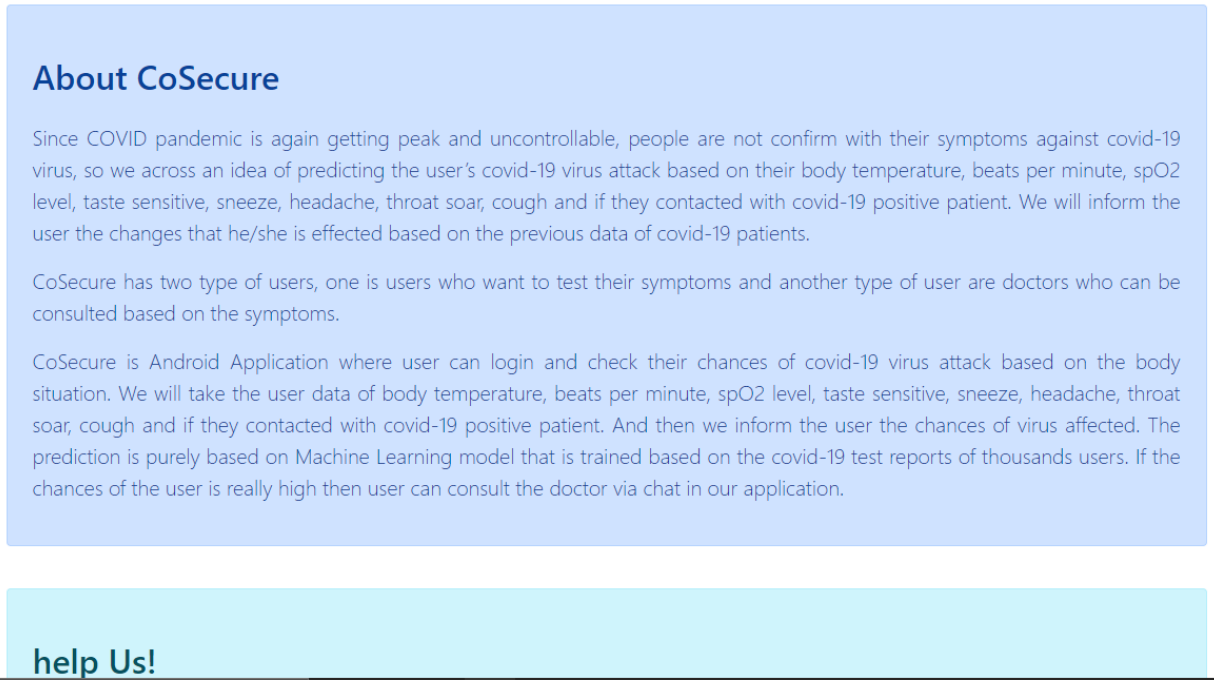

Figure 6.2: About page

This is the about part of page with the information about cosecure.

PREDICTION PAGE

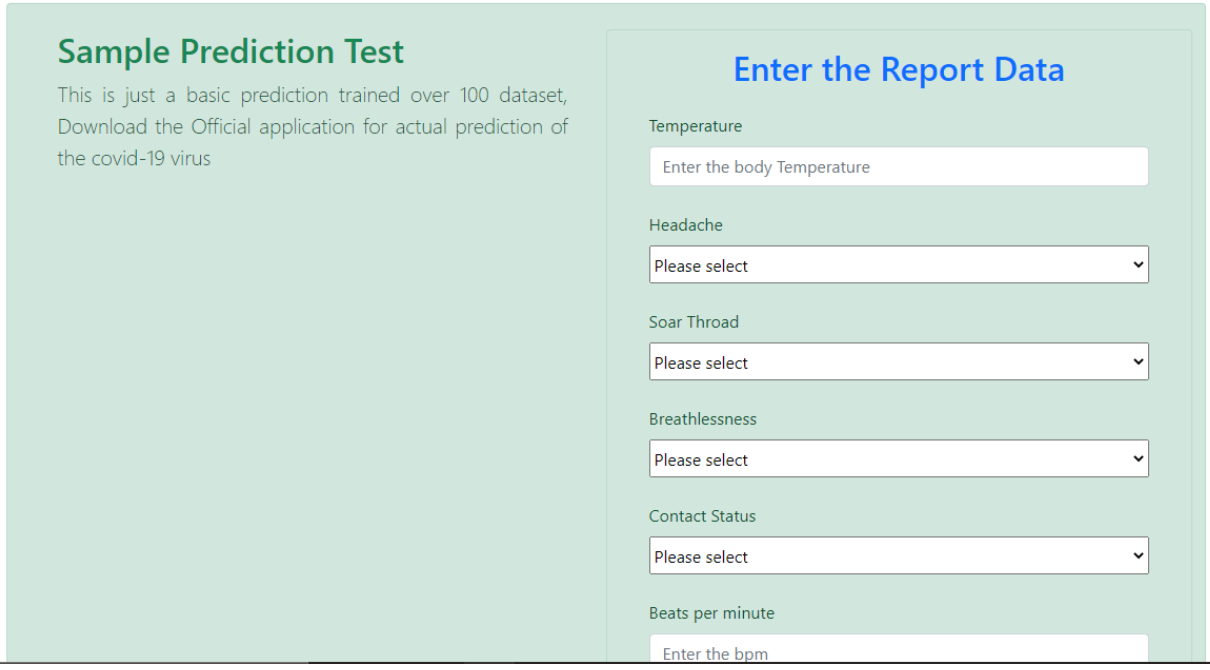

Figure 6.3: predictor page

ADMIN LOGIN PAGE

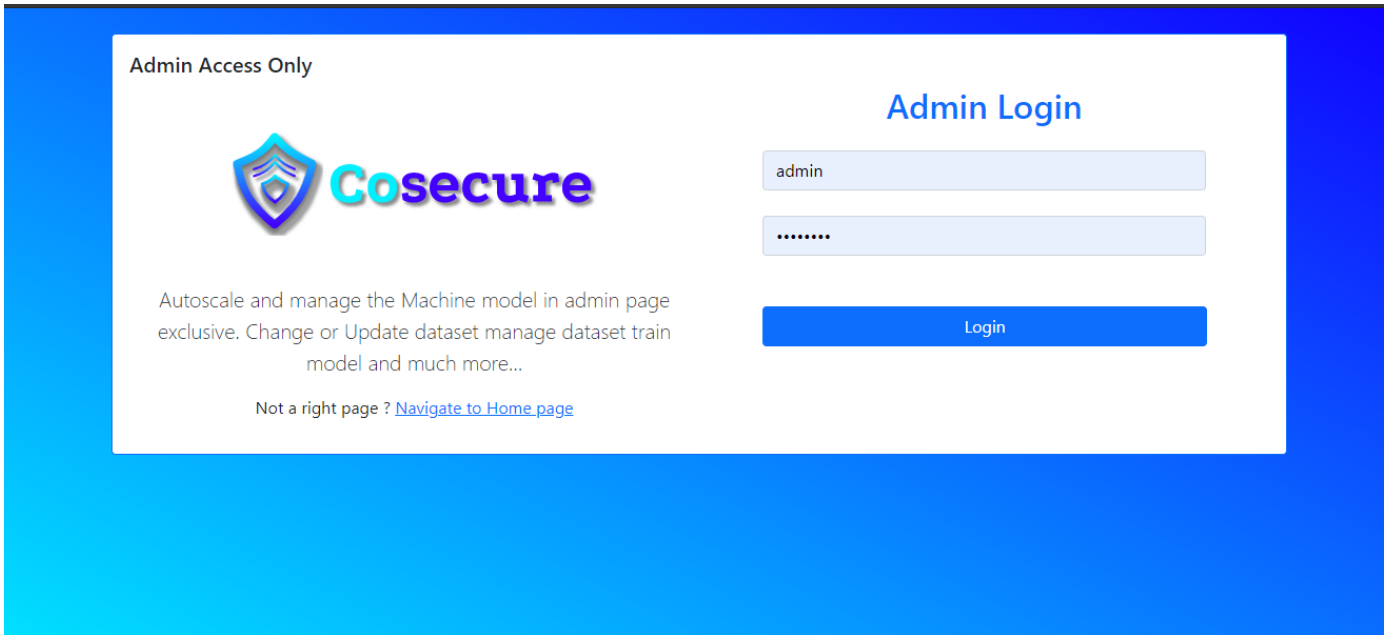

Figure 6.4: Admin Login page

ADMIN PAGE

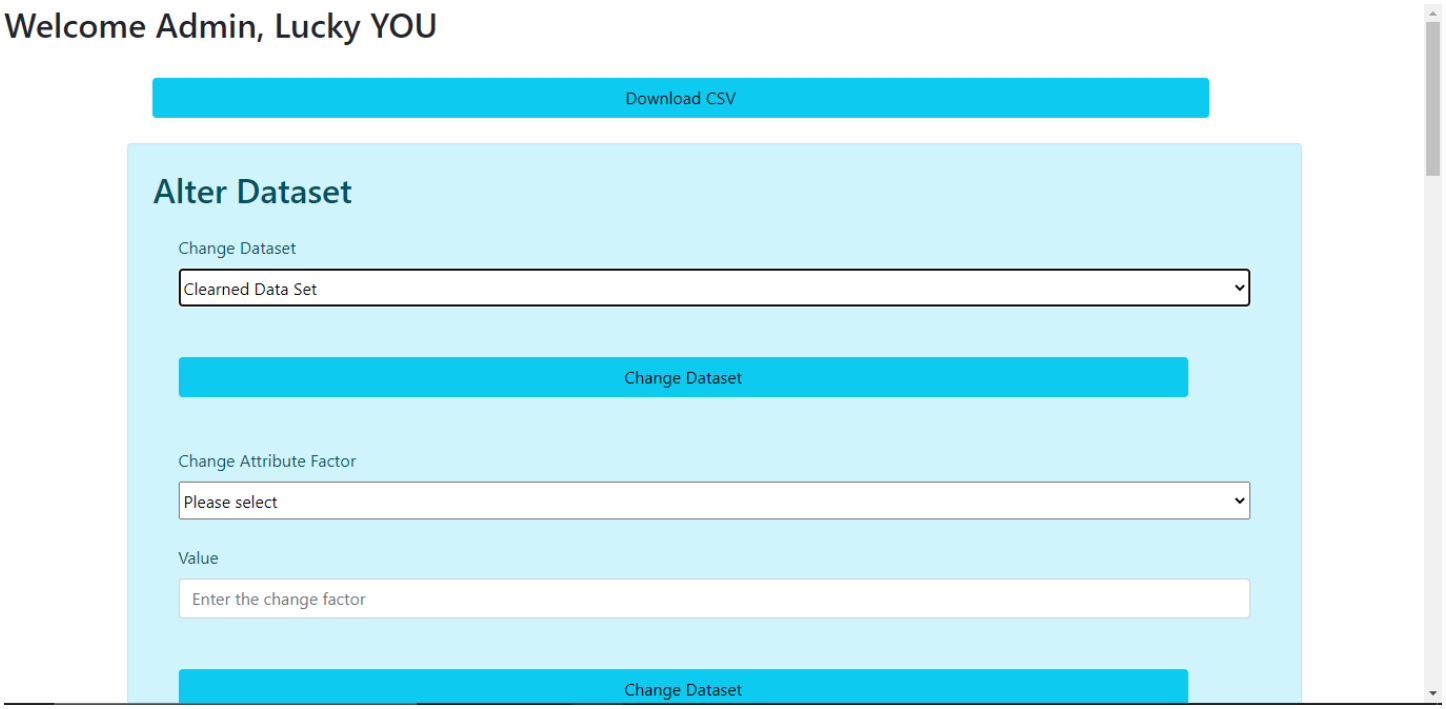

Figure 6.5: Admin page

Admin page database and model maintaining

DATASET PAGE

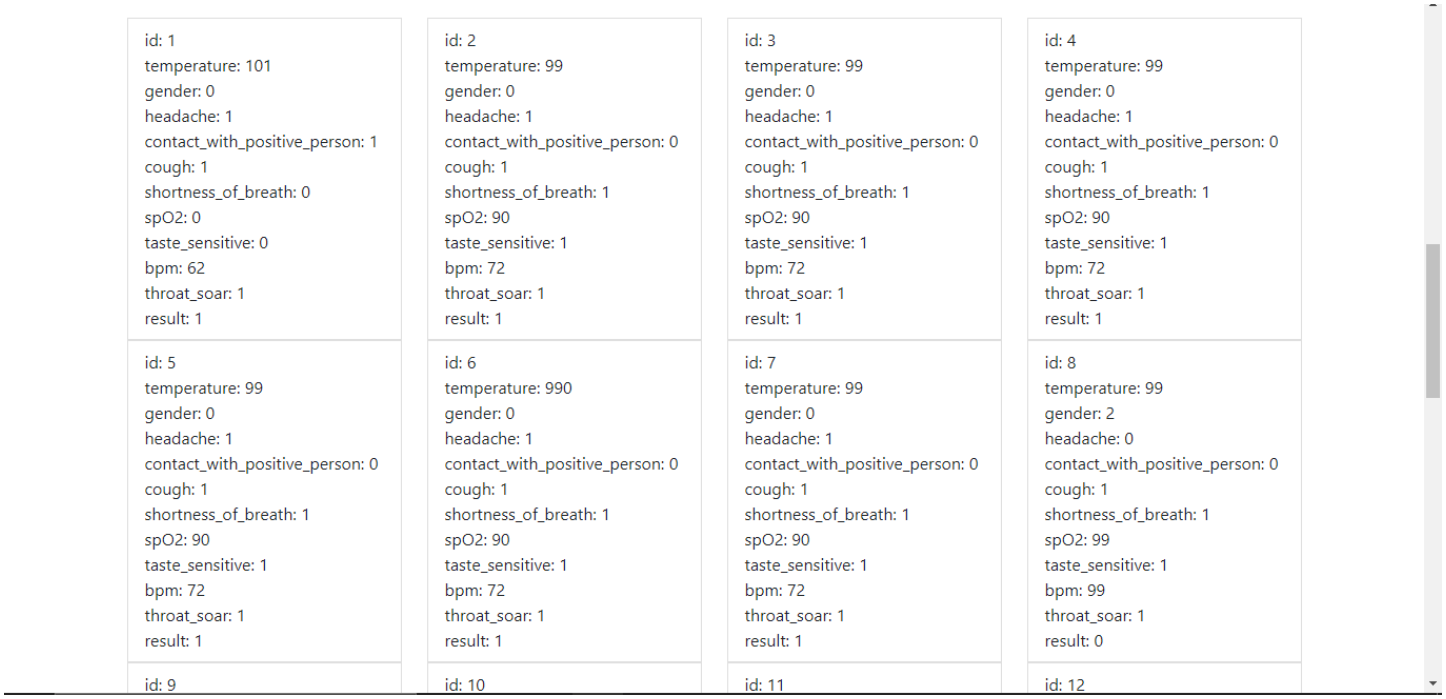

Figure 6.6: Dataset page

ADD REPORT PAGE

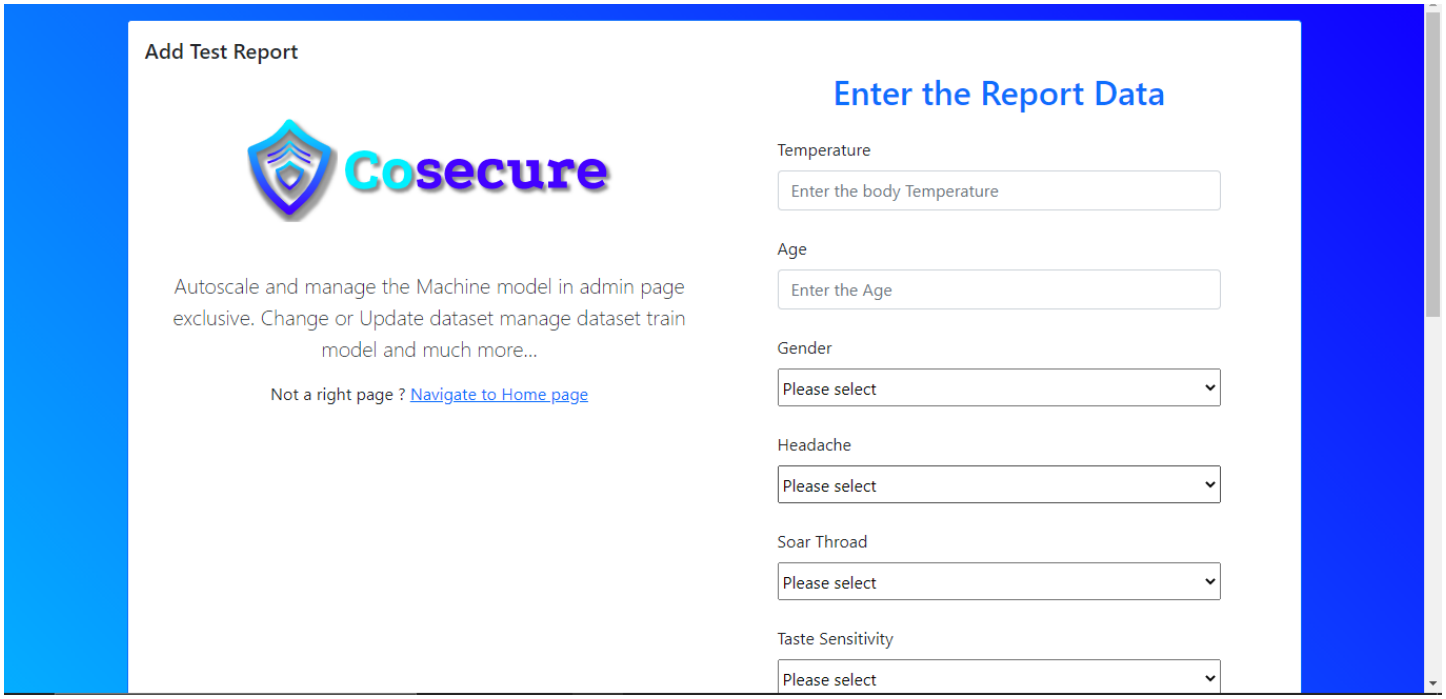

Figure 6.7: Add report page

Conclusion and Future Enhancements

CoSecure is Application where user can login and check their chances of covid-19 virus attack based on the body situation. We will take the user data of body temperature, beats per minute, spO2 level, taste sensitive, sneeze, headache, throat soar, cough and if they contacted with covid-19 positive patient. And then we inform the user the chances of virus affected. The prediction is purely based on Machine Learning model that is trained based on the covid-19 test reports of thousands users. If the chances of the user is really high then user can consult the doctor via chat in our application.

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- Users can add their Covid-19 test report
- Admin can change the dataset
- Admin can download the dataset which was filled by users
- Admin can view the dataset filled by users

FUTURE ENHANCEMENT:

- Making better graphic designs.
- Implementing more machine learning algorithms.
- Making much more user interactive.
- Chat Box with Doctor.
- Doctors Database.
- Alerting Prediction report with Doctors nearby.

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- Postman - https://www.postman.com/
- Bootstrap - https://getbootstrap.com/
- Materialize CSS - https://materializecss.com/
- Python - https://www.djangoproject.com/
- Django - https://www.djangoproject.com/
- Virtualenv - https://virtualenv.pypa.io/
- Git - https://git-scm.com/
- Github - https://github.com/
- Heroku - https://www.heroku.com/
- GIF Maker - https://gifmaker.me/
- JPEG Optimizer - http://jpeg-optimizer.com/
- Google Fonts - https://fonts.google.com/
- Google icons - https://material.io/icons/