**Disease Prediction System for COVID With Electronic Medical Records**

**A PROJECT REPORT**

***Submitted by***

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**ANNA UNIVERSITY: CHENNAI 600 025**

## BONAFIDE CERTIFICATE

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### ABSTRACT

An electronic health record application which is used to extract patient’s information instantly and remotely .Also, It monitors the patient’s health performance and diagnose disease using machine learning algorithms. Conventionally, patient’s history is saved in the form of a prescription for necessary medications, streamline workflow, and to keep track of the patient’s performance in the paper chart containing the type of diseases, suggested medicines, vaccination dates, treatment plans, and the test results of X-rays specific hospitals. However, in the modern age of the computer, prescriptions are saved in digital format must be saved in a digital format to understand even better. Also, it reduces the burden for patients. This digital storage motivates to develop a system that automatically detect diseases using machine learning algorithms. Digitalization will accelerate scientific creativity, bringing better products to market faster. Together these trends will not just benefit science but enable better care for patients as well. We use the smartphone to manage our daily life. From communication to finances, from transportation to household infrastructure, everything depends on it. So, our aim is to develop the mentioned idea above into an app which can be used by everyone. Also, this app helps to store the personal health reports through which we don’t have to take lab reports every time for the check

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**List Of Abbreviations**

|  |  |
| --- | --- |
| CNN | Convolution Neural Network |
| CSS | Cascading Style Sheet |
| CT | Computed Tomography |
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**CHAPTER 1**

**INTRODUCTION**

**CHAPTER 1**

**INTRODUCTION**

* 1. **OVERVIEW**

In modern medicine world, Machine learning is one of the key methods used.With the explosion of the IT industry, and the rise of big data; it became necessary to analyze and predict trends. Slowly over the years machine learning has branched out into almost every major industry, and performs functions that were almost unheard, compared to that mere few years ago. In this work we have concentrated exclusively upon the supervised algorithms. Supervised algorithms can be broadly classified into two sub divisions- Regression algorithms- Regression algorithms are used to predict continuous values. For example, Naive Bayes and KNN algorithms. Classification algorithms are used in order to predict discrete values. For example, linear regression and K Means algorithms.

The focus is to build an EHR application which is used to extract patient’s information instantly and remotely and to monitor the patient’s health performance and diagnose disease using machine learning algorithms. This provide benefits to both patients and doctors to maintain the health records .

In this project, a web application based on machine learning is designed, which provides a doctor-patient platform for disease detection and diagnosis. Some of the fatal diseases like COVID-19,Heart, Diabetes and pneumonia are detected using machine learning algorithms.

## 1.2 MOTIVATION

Conventionally, patient’s history is saved in the form of a prescription for necessary medications, streamline workflow, and to keep track of the patient’s performance in the paper chart containing the type of diseases, suggested medicines, vaccination dates, treatment plans, and the test results of X-rays specific hospitals. Following are few motivational factors-

* + - To save the prescriptions in a digital format.
    - To keep track of the patient’s performance.
    - To enhance the patient’s readability and clarity over medical records .
    - To motivate the patients to constantly monitor their health whenever there is a need.

## 1.3 OBJECTIVE

* To develop an electronic health record application which is used to extract patient’s information instantly and remotely.
* To monitor the patient’s health performance and diagnose disease using machine learning algorithms.

## 1.4 OUTLINE OF THE REPORT

Chapter 2 gives a brief overview of the literature survey done. Covid-19 detection is given in Chapter 3. Introduction to the heart disease diagnosis used in this project is given in Chapter 4. Chapter 5 explains the detection of pneumonia using chest xrays. Chapter 6 gives a brief overview of diabetes detection. Chapter 7 explains the architecture of the project. Chapter 8 puts forward the sample results and the future development of the project.

**CHAPTER 2**

**LITERATURE SURVEY**

**CHAPTER 2**

**LITERATURE SURVEY**

* 1. **ALGORITHM STUDY:**

In [1], the authors proposed a framework model based on Capsule Networks to diagnose Covid-19 (i.e., COVID-CAAPS) disease with the help of X-ray images. Here, number of convolution layers and capsules are used to overcome the problem of class-imbalance. In experimental analysis, they showed the performance of COVID-CAPS on a smaller number of trainable parameters. Authors mentioned about the considered trained model which is publicly available on Github page [2] for open access. As a result, they concluded that the proposed model shows accuracy 95.7%, whereas sensitivity is shown as 90% and specificity as 95.80% while applying a smaller number of trainable parameters. In [3], the authors considered the first few cases of Covid-19 infected cases in France. Out of these three persons, two were diagnosed in Paris and one in Bordeaux before coming in contact with Covid-19 diseases, they were staying in Wuhan, China. Thus it will be effective when detected at first.

In [4], authors have given a study about the total number of patients infected form Covid-19 and death cases all over the world. The authors recommended a deep based methodology for detecting patients infected from Covid-19 by using X-ray images. This method is beneficial to hospital doctors for early detecting the cases of covid-19 infected patients. They are able to find 97.48% accuracy of the proposed model for lung classification with the help of different matrices parameters. Also, the authors discussed how covid-19 is exposed as a novel pneumonia disease in China, city Wuhan. The primary purpose of this paper was to present a new framework of deep learning, i.e., COVIDX-Net, to help the clinical practitioner in automatically diagnose Covid-19 disease by using X-ray images.

Further, Another paper on covid detection [5], an author has given a study about the impact of covid-19 on kidney and failure of acute renal. They considered a dataset of 49 patients who suffered from Covid-19 disease and segregated into two categories of recovery groups (i.e., fine and worst). The serological and viral shedding was explored dynamically. Then, the authors identified the risk factor of weak recovery and lung infections. Finally, they concluded that 58% of the patients had a weak recovery.

In this paper, An expert clinical decision support system to predict disease using classification techniques by the authors. The models built are Decision Tree and K-Nearest Neighbor. The proposed system assists the doctor to predict disease correctly, and the prediction makes patients, and medical insurance providers benefited [13]..

In paper [6], the authors explored the (CXR) for identification of lung abnormality. They show that the medical community will rely on CXR because of its full availability and reduced infection control. They used 123 front views of X-ray for the detection of Covid-19 diseases. Also they discussed the role of AI tools in healthcare. They also talked about the challenges of implementing AI tools on less dataset of X-ray images (which is available publically). They considered a dataset of X-rays and CT images from several resources and applied deep learning and transfer learning algorithms to detect Covid-19 diseases. Pre-trained and modified CNN model has been used on a collected dataset. As a result, they concluded that the pre-trained model gave 98% accuracy, and changed CNN shows 94.1% accuracy of the model. The authors extracted two subsets (16\*16 and 32\*32) patches to generate sub-datasets, which is derived from 150 CT images, and 3000 X-ray images have been labeled for Covid-19.phone.

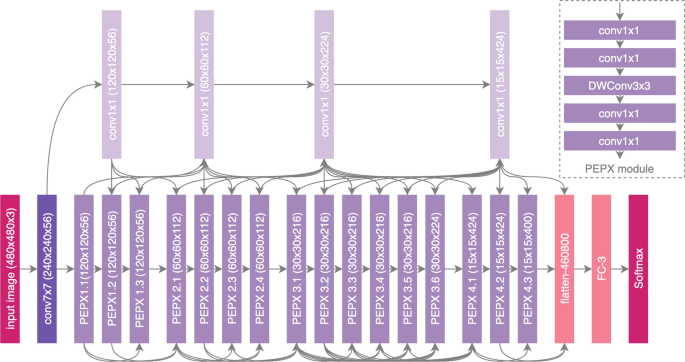
Further, fusion and ranking methods have been applied to enhance the performance of a proposed methodology. The authors used SVM to classify the processed data, and the CNN model was used to transfer learning. As a result, they showed that set 2 received good accuracy as compared to set 1.

In [7], the authors developed a deep learning model called COVNet to extract visual characteristics from chest CT scans to detect novel coronavirus. They used the visual characteristics to distinguish community-acquired pneumonia from other lung diseases other than pneumonia. COVNet is not, however, able to classify the severity of this disease.In this study a dataset they called COVIDx and COVID-Net was used to detect COVID-19 from chest X-ray images.



**Figure 2.1 COVID-19 chest X-Ray image**

The dataset consists of chest X-ray images in four classes: radiographs of non-infected cases, bacterial radiographs, viral radiographs for COVID-19, and non-COVID-19 pneumonia-positive radiographs. They reported an overall accuracy of 83.5%. To improve on previous studies, the authors presented another CNN with fewer parameters but a superior performance. The authors used the same dataset to create COVID-ResNet to differentiate COVID-19 cases from the other four pneumonia cases and achieve a better performance than with COVID-Net.



### Figure 2.2 COVID-Net

### In 2011, [8] made use of Decision Tree model to predict heart disease and get a high accuracy of 99%, which inspires us to use a better version of Decision Tree and it is Random Forest. Unfortunately, the paper uses a dataset with 3000 instances but dose not provide a reference of how they get the data. The UCI website only provides 303 instances of dataset so we doubt where the author gets 3000 instances of dataset.

In 2012, [9] author made the prediction by using three models and such models are Naïve Bayes, Decision Trees and Neural Network. We are using the same dataset as he did. The difference between his work and ours is that he added 2 more features into the dataset, which means there are 15 features of his work while there are 13 features in our dataset what he did on dataset inspires us to make useful change to our dataset (Try normalization on dataset) to make our results comprehensive. However, during this paper there are only 3 models. More models need to be considered so that the results are comprehensive..

* 1. **DISEASE STUDY:**

The Diseases we majorly deal with are Covid-19, Pneumonia, Heart Disease, and finally Diabetes. We all know how coronavirus made a great impact in everyone’s life. Thus its better to prevent before it startsto spread. Not only covid-19, the rest three diseases have made a deadly impact on human lives especially on aged people. Let’s have a deep view on how authors classify and diagnose different diseases.

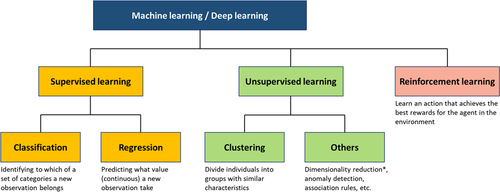
One of the titles of the published paper is Diagnosis of diabetes using classification mining techniques. They built two classification models which were Decision Tree and Naive Bayes. Their hopes to propose a quicker and more efficient technique of diagnosing the disease, leading to timely treatment of the patients. Their research hopes to offer a faster and more efficient method of diagnosing the disease, leading to timely treatment of the patients.

The analysis of related work gives results on various healthcare datasets, where analysis and predictions were carried out using various methods and techniques. Various prediction models have been developed and implemented by various researchers using variants of data mining techniques, machine learning algorithms or also combination of these techniques. Also in 2015 they implemented a system using Hadoop and Map Reduce technique for analysis of Diabetic data. This system predicts type of diabetes and also risks associated with it. The system is Hadoop based and is economical for any healthcare organization. In [10] the author used classification technique to study hidden patterns in diabetes dataset. Naïve Bayes and Decision Trees were used in this model. Comparison was made for performance of both algorithms and effectiveness of both algorithms was shown as a result.

In [11] the authors used classification technique where they used decision tree algorithm to find hidden patterns from the dataset for classifying efficiently.

In [12] the author used ANN in combination with fuzzy logic to predict diabetes. Also in another paper [13] they proposed Hybrid Prediction Model which includes Simple K-means clustering algorithm, followed by application of classification algorithm to the result obtained from clustering algorithm. In order to build classifiers C4.5 decision tree algorithm is used.

One more paper on Diabetes [14] ,the authors proposed a model using Random Forest Classifier to forecast diabetes behavior. In [15] they used decision tree algorithm, Neural Network, K-means clustering algorithm and Visualization to predict diabetes.



**Figure 2.3 Types of Machine Learning**

The other paper which was published to tackle this problem was by V. Anuja Kumari and R.Chitra under the title of Classification Of Diabetes Disease Using Support Vector Machine. Their experimental results obtained show that the support vector machine can be successfully used for diagnosing diabetes disease [14]

One more paper published under this topic is titled as logistic regression and SVM based Diabetes prediction System .This aims to predict diabetes via three different supervised machine learning methods including SVM, Logistic regression. This project also aims to propose a useful technique for earlier detection of diabetes disease [15]

Thus we came to know how authors of different papers classified and diagnosed different diseases using variety of dataset and various algorithms. From the above verified papers, we conclude that Random Forest Algorithm showed better performance for Heart Disease prediction and Diabetes Diagnosis. In addition to this, CNN showed much better classification of chest X-rays into pneumonia and covid-19.

**CHAPTER 3**

**SYSTEM ANALYSIS**

**CHAPTER 3**

**SYSTEM ANALYSIS**

**3.1 EXISTING SYSTEM**

The Existing System uses paper prescription hand written by the Doctors for the Medical prescription of tablets which are even hard to read by the patients and patients need to bring them safely for their next checkup so that the Doctors can verify the previous health record of the patients, which are difficult for the patients to retain the prescription for long years and even they get crushed and lost sometimes in the Longrun.

**EXISTING SYSTEM DISADVANTAGES**

So far the disadvantages of paper prescriptions are:

* Volatile nature of prescriptions
* Maintaining record in long run

Volatile nature of prescriptions: these prescription can be easily torn and easily be destroyed and become difficult to read .

Maintaining record in long run : since patients make a frequent visit to the hospital for each visit the get several papers of prescriptions and report which are needed to be stored for future medical references and it becomes difficult to store them in time orderly manner which makes difficult to access a record in previous checkups.

**3.2 PROPOSED SYSTEM**

When comparing with the typical health records of patients in papers the proposed System makes to store the health records electronically that is to store them in digital format which makes the patients to access their health prescription, medical records ,check history and several other factors in this System and for in the long run it is even easier to Access the checkup history, previous medical prescription, reports and etc. it can be used to store the records safely and can be accessed anywhere digitally so the patients don’t need to carry the prescription everywhere.

**Advantage:**

* Can be accessed anywhere anytime
* Safe storage of records
* Prescriptions and checkup history in time orderly manner

**3.3 REQUIREMENT ANALYSIS AND SPECIFICATION**

**3.3.1 HARDWARE REQUIREMENTS**

* PENTIUM CORE PROCESSING
* PC/LAPTOP/TABLET
* MINIMUM 1 GB RAM AND 10 GB HDD
* STABLE INTERNET CONNECTION

**3.3.2 SOFTWARE REQUIREMENTS**

* XAMPP SERVER
* PYTHON IDLE
* BROWSER
* ANY TEXT EDITOR

**CHAPTER 4**

**SYSTEM DESIGN**

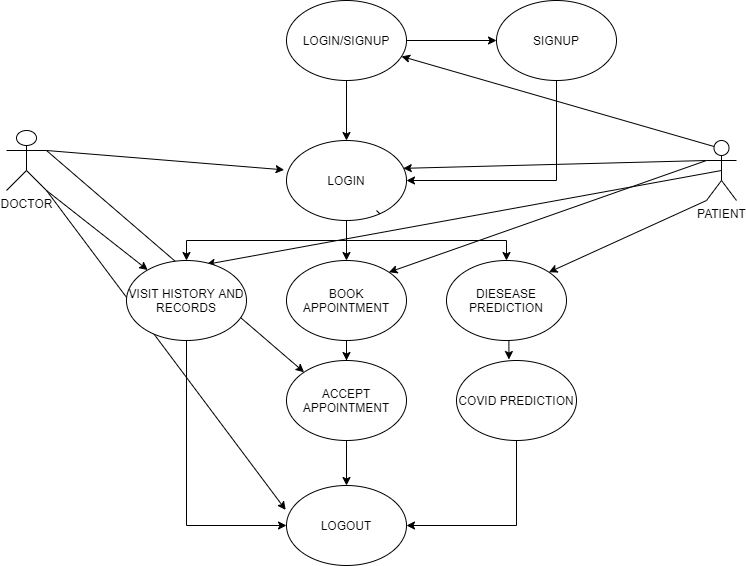
**CHAPTER 4**

**SYSTEM DESIGN**

**4.1 UML DIAGRAMS**

**4.1.1 USE CASE DIAGRAM**

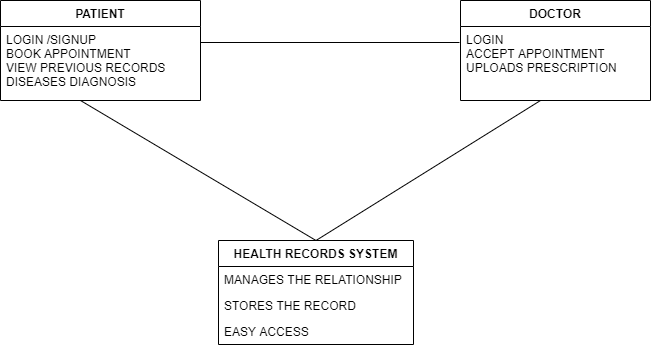
A **use case diagram** at its simplest is a representation of a user's interaction with the system that shows the relationship between the user and the different use cases in which the user is involved. A use case diagram can identify the different types of users of a system and the different use cases and will often be accompanied by other types of diagrams as well.

****

**Fig 4.1.1. Use case diagram**

**4.1.2 PACKAGE DIAGRAM**

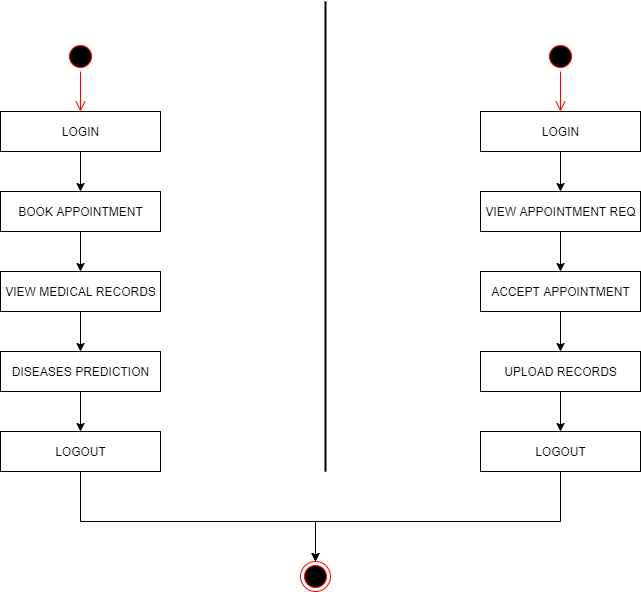
A package diagram, a kind of structural diagram, shows the arrangement and organization of model elements in middle to large scale projects. The package diagram can show both structure and dependencies between sub-systems or modules, showing different views of a system.

****

**Fig 4.1.2. Package diagram**

**4.1.3 FLOW DIAGRAM**

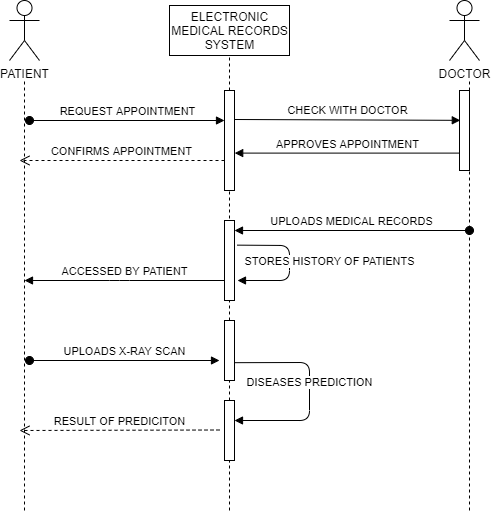
A diagram of the sequence of movements or actions of people or things involved in a complex system or activity.

****

**Fig 4.1.3. Flow diagram**

**4.1.4 SEQUENCE DIAGRAM**

A sequence diagram shows object interactions arranged in time sequence. It depicts the objects and classes involved in the scenario and the sequence of messages exchanged between the objects needed to carry out the functionality of the scenario. Sequence diagrams are typically associated with use case realizations in the sequence diagram of the system under development.

****

**Fig 4.1.4. Sequence Diagram**

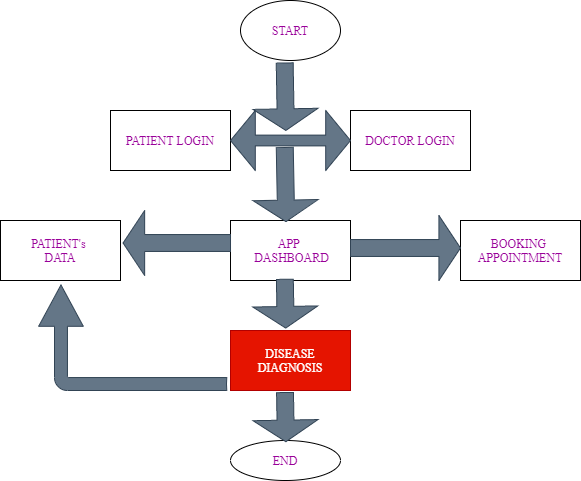
**CHAPTER 5**

**SYSTEM ARCHITECTURE**

**CHAPTER 5**

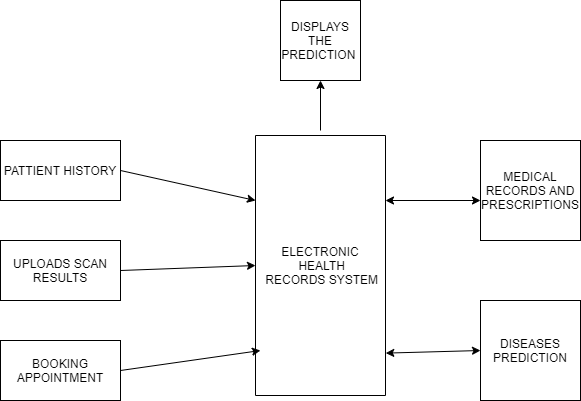
**SYSTEM ARCHITECTURE**

**5.1 ARCHITECTURE OVERVIEW**



**Fig 5.1.1 Architecture Diagram**

**5.1 BLOCK DIAGRAM**



**Fig 5.1.2 Block Diagram**

## 5.2 COVID DETECTION

**5.2.1 INTRODUCTION**

Corona virus disease 2019 (COVID-19) is an infectious disease caused by the severe acute respiratory syndrome corona virus 2, which was first detected in December 2019 in Wuhan, China, and has since rapidly spread to nearly every country. Currently, very little is known about the virus’ mutation patterns, the possibility of reinfection, and possible long-term health effects; and, while fatal, it remains too early to pinpoint the mortality rate for each patient demographic, given the political and medical issues surrounding the reporting and collection of data.

# 5.2.2 Symptoms

Signs and symptoms of COVID-19 may appear 2-14 days after exposure.

This time after exposure and before having symptoms is called the incubation

period. Common signs and symptoms can include:

* Fever
* Cough
* Tiredness

Early symptoms of COVID-19 may include a loss of taste or smell.

The severity of COVID-19 can range from very mild to severe. Some people

may have only a few symptoms, and some people may have no symptoms

at all. Some people may experience worsened symptoms, such as worsened

shortness of breath and pneumonia, about a week after symptoms start.

People who are older have a higher risk of serious illness from COVID-19, and

the risk increases with age. People who have existing medical conditions

also may have a higher risk of serious illness.

## Complications

Although most people with COVID-19 have mild to moderate symptoms, the disease can cause severe medical complications and lead to death in some people. Older adults or people with existing medical conditions are at greater risk of becoming seriously ill with COVID-19.

Complications can include:

* Pneumonia and trouble breathing
* Organ failure in several organs
* Heart problems
* A severe lung condition that causes a low amount of oxygen to go

through your bloodstream to your organs (acute respiratory distress

syndrome)

* Blood clots
* Acute kidney injury
* Additional viral and bacterial infections

# 5.2.3 Causes

Infection with the new coronavirus (severe acute respiratory syndrome coronavirus 2, or SARS-CoV-2) causes coronavirus disease 2019 (COVID-19).

The virus that causes COVID-19 spreads easily among people, and more continues to be discovered over time about how it spreads. Data has shown that it spreads mainly from person to person among those in close contact (within about 6 feet, or 2 meters). The virus spreads by respiratory droplets released when someone with the virus coughs, sneezes, breathes, sings or talks. These droplets can be inhaled or land in the mouth, nose or eyes of a person nearby. As well as these respiratory causes, [cardiovascular](https://en.wikipedia.org/wiki/Cardiovascular) causes such as [shunts](https://en.wikipedia.org/wiki/Shunt_(medical)) may also result in hypoxemia.

In some situations, the COVID-19 virus can spread by a person being exposed to small droplets or aerosols that stay in the air for several minutes or hours — called airborne transmission. It's not yet known how common it is for the virus to spread this way.

It can also spread if a person touches a surface or object with the virus on it and then touches his or her mouth, nose or eyes, although this isn't considered to be a main way it spreads.

## Risk Factors

Risk factors for COVID-19 appear to include:

* Close contact (within 6 feet, or 2 meters) with someone who has COVID-19
* Being coughed or sneezed on by an infected person

# 5.2.4 Algorithm Used[ Convolutional Neural Network ]

# Complete diagnosis of COVID-19

Pathological tests performed in laboratories are taking more time. A fast and accurate diagnosis is necessary for an effective struggle against COVID-19. For this reason, several experts started to use radiological imaging methods. These procedures are performed with computed tomography (CT) or X-ray imaging techniques. COVID-19 cases have similar features in CT images in the early and late stages. It shows a circular and inward diffusion from within the image. Therefore, radiological imaging provides the detection of suspicious cases with an accuracy of 90%. Moreover, as deep learning continues to gain ground in medical procedures and techniques for diagnostic purposes, COVID-19 imaging testing could largely benefit from this strong nonlinear modeling capability.

The convolutional neural network (CNN)is a powerful tool that is widely used for image classification. Its hierarchical structure and efficient feature extraction from an image make CNN a dynamic model for image classification. Initially, layers are organized in three dimensions: depth, height, and width. The neurons in a given layer do not attach to all the neurons in the next layer, but only to a limited number of neurons in that layer. Finally, an output is reduced to a single probability vector score, coordinated with the depth dimension.

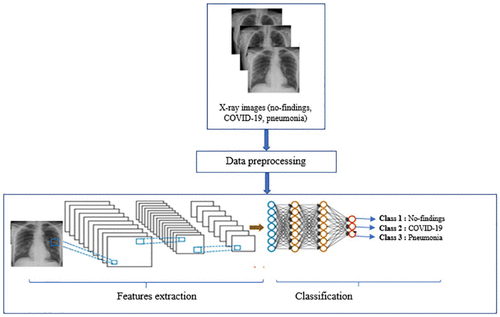
The CNN classifier uses various layers—convolution layer, pooling layer, and fully connected layer—for model-building and testing purposes. The CNN model uses these steps:

* Feature extraction: Several convolutions and pooling operations are used to evaluate and monitor potential features. The Maxpooling layer is used to reduce the spatial size of the convolved features.
* Classification: In this step, the fully connected layers act as a classifier. It uses the extracted features and evaluates the probability for the object in the image.

**Materials and Methods**

In this study, we propose a new CNN-based method of classifying COVID-19, pneumonia, and no-findings chest X-ray images.

The below **figure 3.1** shows the flow diagram of proposed method:

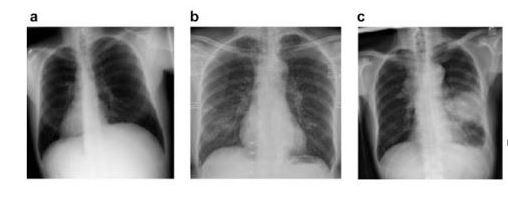
****

**Figure 5.2.1 Flow diagram of proposed method**

**X-ray image Dataset**

In this work, we used around 4200 chest X-ray images of COVID-19 obtained from the open-source GitHub repository, shared by Dr. Joseph Cohen,and the Covid-19 Radiography dataset. We also used the ChestX-ray8 database on no-findings and pneumonia images.

Below figure 3.2 shows some examples of chest X-ray images from prepared dataset:



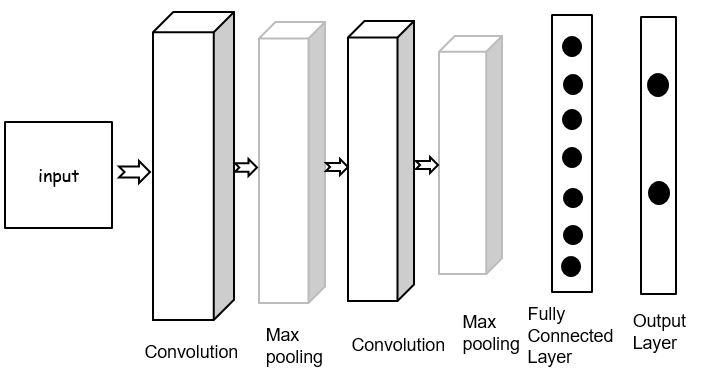
**Figure 5.2.2:**

**(a) Chest X-ray image of Normal patient**

**(b) Chest X-ray image of COVID-19 patient**

**(c)Chest X-ray image of Normal patient**

**Proposed Model**

Figure 3.3 shows the proposed CNN architecture used to classify the chest X-ray images. ****

**Figure 5.2.3 Proposed CNN architecture**

To detect COVID-19 cases, we have created a very simple CNN model composed of 2 convolutional layers with Max pooling after each convolutional layer, and one fully connected layer. The convolution layers have 32 filters, each of which has a kernel size of 64×64.

The Maxpooling method is used in all pooling operations. It reduces an input by taking the maximum of a region determined by its filter. The neurons of this layer are connected to all the activation functions of the previous layer. The main responsibility of the Maxpooling layer is to classify the convolutional features extracted from the image datasets into the defined classes.

Finally, the one fully connected layer act as a classifier. They use extracted features and evaluate the probability of an object’s presence in the image. Usually, activation functions and a dropout layer are used to establish nonlinearity and minimize overfitting, respectively.

* 1. **HEART DISEASE DETECTION**

**5.3.1 INTRODUCTION**

Our problem is that we want to predict whether patients have heart disease by given some features of users. This is important to medical fields. If such a prediction is accurate enough, we can not only avoid wrong diagnosis but also save human resources. When a patient without a heart disease is diagnosed with heart disease, he will fall into unnecessary panic and when a patient with heart disease is not diagnosed with heart disease, he will miss the best chance to cure his disease. Such wrong diagnosis is painful to both patients and hospitals. With accurate predictions, we can solve the unnecessary trouble. Besides, if we can apply our machine learning tool into medical prediction, we will save human resource because we do not need complicated diagnosis process in hospitals

**5.3.2 Data Set and Features**

Our dataset is based on UCI heart disease data set and we have 303 instances.Acc s. According to UCI, “This database contains 76 attributes, but all published experiments refer to using a subset of 14 of them.”We guess too many features will bring too much noise so people has done feature extraction and reduce 76 features to 14 features. To better understand the meaning of the features, we have the responsibility to explain some of the attributes of original dataset from UCI as follows:

• age: age in years

• sex: sex (1 = male; 0 = female)

• cp: chest pain type

-- Value 0: typical angina

-- Value 1: atypical angina

-- Value 2: non-anginal pain

-- Value 3: asymptomatic

• trestbps: resting blood pressure (in mm Hg on admission to the hospital)

• chol: serum cholestoral in mg/dl

• fbs: (fasting blood sugar > 120 mg/dl) (1 = true; 0 = false)

• target: Heart disease (0 = no, 1 = yes)

Since the original dataset has missing values, we just downloaded a clean dataset from Kaggle. We have split the dataset into 80% (242 instances) for training and 20%(61 instances) for test. We did normalization on our dataset to avoid overfitting. What we did to our dataset is to change 1s to 0s in target column and vice versa in order to make value 1 indicate the presence of heart disease and make value 0 indicate the absence of heart disease. Given such dataset we can do many interesting predicative tasks. For example, we can use these features to predict chest pain type. But the most important thing is that given the 13 attributes from a patient, we want to predict whether he has the heart disease or not because keeping healthy is very import to people.

**5.3.3 Algorithm used**

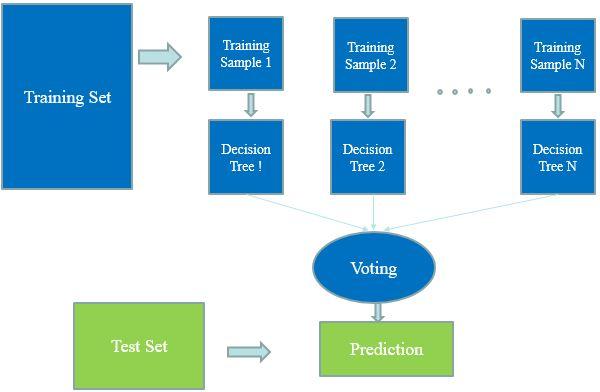
As per the existing models, random forest gives the best accuracy among other algorithms. Hence, we will be using random forest classifier.

Random Forest is an ensemble learning method for classification and regression by constructing multiple decision trees in training and outputting the classification or prediction(regression). The goal of Random Forest is to combine weak leaning models into a strong and robust leaning model. From a tutorial online, we learn that the algorithm of Random Forest can be summarized in 4 steps:

Step 1: Randomly draw M bootstrap samples from the training set with replacement.

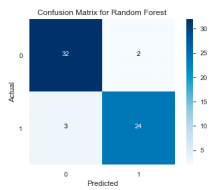
Step 2: Grow a decision tree from the bootstrap samples. At each node: Randomly select K features without replacement and split the node by finding the best cut among the selected features that maximizes the information gain. Step 3: Repeat the steps 1 and 2 T times to get T trees;

Step 4: Aggregate the predictions made by different trees via the majority vote.



**Figure 5.3.1 shows the random forest algorithm**

The confusion matrix of Random Forest is:



**Figure 5.3.2 Confusion Matrix for Random Forest**

The train accuracy is 100% and the test accuracy is 91.80%. At the first beginning we use the default parameters (n\_estimators=100, which means the number of trees in the forest is 100 and max\_depth = None, which means the nodes are expanded until all leaves are pure or all leaves contain less than the minimum number of samples required to split an internal node). Though we get 100% test accuracy, we only get 85.25% test accuracy. We guess it might be overfitting. One reason might be the training data is not generalized during the training process so we decided to shuffle the dataset again and we tried the parameter random\_state from 1 to 2000. When random\_state is 1826, the test accuracy is 91.80%. Then we tried experiments on parameters of n\_estimatros(from 10 to 300) and max\_depth(from 10 to 300) and the best test accuracy is still 91.80%. This means with random\_state=1825, the other default parameters are good enough to get the best test accuracy. For example, the number of trees in the forest is 100, which is appropriate. If the number of trees is small, it will cause underfitting because the model has not been optimized for the training data, let alone the test data. If the number of trees is too big, it will cause overfitting because the model becomes so complex and sensitive to new data. The advantage of Random Forest is that it can deal with a dataset with high features and balance the variance and it is not sensitive to the noise of the data. Among these 5 models, Random Forest outperforms any other models.

**5.4 PNEUMONIA DETECTION**

**5.4.1 Introduction**

Pneumonia is considered the greatest cause of child fatalities all over the world. Approximately 1.4 million children die of pneumonia every year, which is 18% of the total children died at less than five years old [1]. Globally, overall, two billion people are suffering from pneumonia every year [1]. Pneumonia is a lung infection, which can be caused by either bacteria or viruses. Luckily, this bacterial or viral infectious disease can be well treated by antibiotics and antivirals drugs.

**5.4.2 Symptoms**

* Cough, which may produce greenish, yellow or even bloody mucus.
* Fever, sweating and shaking chills.
* Shortnessofbreath.
* Rapid, shallow breathing.
* Sharp or stabbing chestpain that gets worse when you breathe deeply or cough
* Lossofappetite, low energy, and fatigue.

**5.4.3 Algorithm Used**

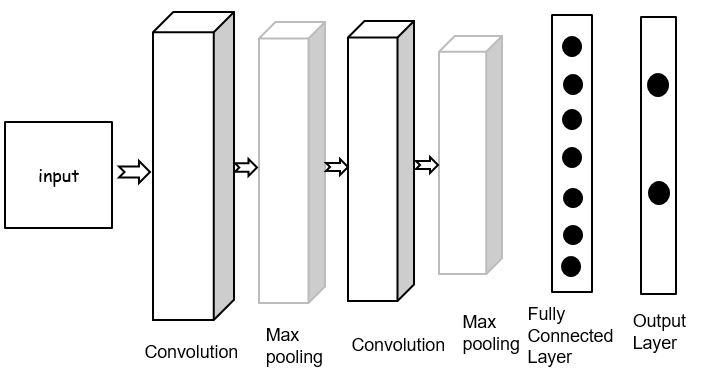
**Convolutional Neural Networks (CNNs)**

CNN have been popular due to their improved performance in image classification. The convolutional layers in the network along with filters help in extracting the spatial and temporal features in an image. The layers have a weight-sharing technique, which helps in reducing computation efforts.

Architecture wise, CNNs are simply feed forward artificial neural networks (ANNs) with two constraints: neurons in the same filter are only connected to local patches of the image to preserve spatial structure and their weights are shared to reduce the total number of the model’s parameters. A CNN consists of three building blocks:

1. a convolution layer to learn features,
2. a max-pooling (subsampling) layer is to down sample the image and reduce the dimensionality and thereby reduction in computational efforts, and
3. a fully connected layer to equip the network with classification capabilities

The architectural overview of CNN is illustrated in Figure 5.1

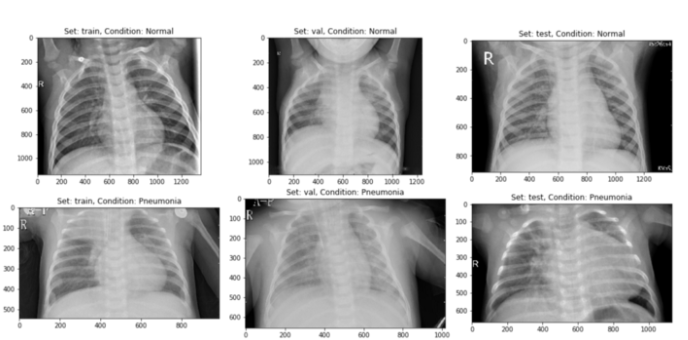
****

**Figure 5.4.1 Convolutional Neural Network(CNN) Architecture**

**5.4.4 Methodology**

**Data set**

The dataset used in this project is from  Kaggle. In the data set folder, we have split data set into 3 sub folders called train, test and val. the data in the*train* folder consists of 1341, 1345, and 2530 samples for *normal*, *virus* and *bacteria* class respectively.



**Figure 5.4.2 Chest X-Ray images from data set**

**Detection**

To detect Pneumonia, we have created a very simple CNN model composed of 2 convolutional layers with Maxpooling after each convolutional layer, and one fully connected layer. The convolution layers have 32 filters, each of which has a kernel size of 64×64.

The Maxpooling method is used in all pooling operations. It reduces an input by taking the maximum of a region determined by its filter. The neurons of this layer are connected to all the activation functions of the previous layer. The main responsibility of the Maxpooling layer is to classify the convolutional features extracted from the image datasets into the defined classes.

Finally, the one fully connected layer act as a classifier. They use extracted features and evaluate the probability of an object’s presence in the image. Usually, activation functions and a dropout layer are used to establish nonlinearity and minimize overfitting, respectively.

## 

**5.5 RANDOM FOREST**

As per the existing models, random forest gives the best accuracy among other algorithms. Hence, we will be using random forest classifier.

Random Forest is an ensemble learning method for classification and regression by constructing multiple decision trees in training and outputting the classification or prediction(regression). The goal of Random Forest is to combine weak leaning models into a strong and robust leaning model. From a tutorial online, we learn that the algorithm of Random Forest can be summarized in 4 steps:

**Step 1**:

Randomly draw M bootstrap samples from the training set with replacement.

**Step 2**:

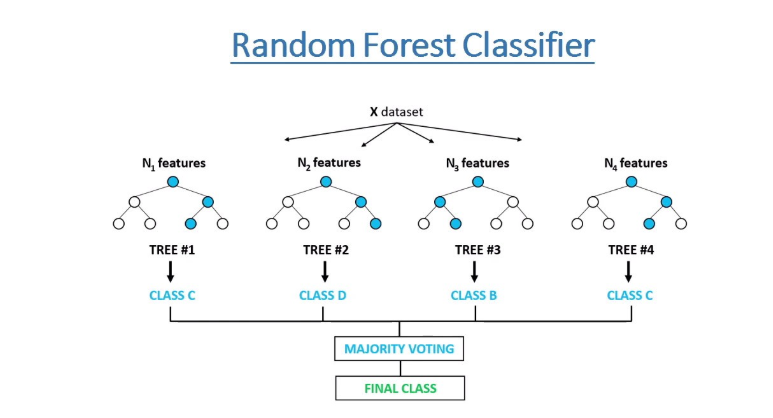
Grow a decision tree from the bootstrap samples. At each node: Randomly select K features without replacement and split the node by finding the best cut among the selected features that maximizes the information gain.

**Step 3**:

Repeat the steps 1 and 2 T times to get T trees;

**Step 4**:

Aggregate the predictions made by different trees via the majority vote.



**Figure 5.5.1 Random Forest**

The hyper-parameters in random forest are either used to increase the predictive power of the model or to make the model faster. Let's look at the hyper-parameters of sklearns built-in random forest function.

**1. Increasing the predictive power**

Firstly, there is the n\_estimatorshyper-parameter, which is just

the number of trees the algorithm builds before taking the maximum voting or taking the averages of predictions. In general, a higher number of trees increases the performance and makes the predictions more stable, but it also slows down the computation.

**2. Increasing the model's speed**

The n jobs hyperparameter tells the engine how many processors it

is allowed to use. If it has a value of one, it can only use one processor. A value of “-1”

means that there is no limit.

forest algorithm is fast enough but there can certainly be situations where run-time

In finance, for example, it is used to detect customers more likely to repay their debt on time, or use a bank's services more frequently. In this domain it is also used to detect fraudsters out to scam the bank. In trading, the algorithm can be used to determine a stock's future behavior.

In the healthcare domain it is used to identify the correct combination of components in medicine and to analyze a patient’s medical history to identify diseases.

**CHAPTER 6**

**SYSTEM IMPLEMENTATION**

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**SYSTEM IMPLEMENTATION**

**6.1 CODING**

**Main page**

<!DOCTYPE html>

<head>

<meta charset="utf-8">

<title>CODEIO</title>

<!-- mobile responsive meta -->

<meta name="viewport" content="width=device-width, initial-scale=1">

<meta name="viewport" content="width=device-width, initial-scale=1, maximum-scale=1">

<!-- \*\* Plugins Needed for the Project \*\* -->

<!-- Bootstrap -->

<link rel="stylesheet" href="assets1/plugins/bootstrap/bootstrap.min.css">

<!-- themefy-icon -->

<link rel="stylesheet" href="assets1/plugins/themify-icons/themify-icons.css">

<!-- slick slider -->

<link rel="stylesheet" href="assets1/plugins/slick/slick.css">

<!-- venobox popup -->

<link rel="stylesheet" href="assets1/plugins/Venobox/venobox.css">

<!-- aos -->

<link rel="stylesheet" href="assets1/plugins/aos/aos.css">

<!-- Main Stylesheet -->

<link href="assets1/css/style.css" rel="stylesheet">

<link rel="shortcut icon" href="assets/images/favicon.ico">

</head>

<body>

<!-- navigation -->

<section class="fixed-top navigation">

<div class="container">

<nav class="navbar navbar-expand-lg navbar-light">

<a class="navbar-brand" href="index.php">

<span class="logo-lg">

<img src="assets/images/Logo-foox.png" alt height="34">

</span>

</a>

<button class="navbar-toggler border-0" type="button" data-toggle="collapse" data-target="#navbar"

aria-controls="navbar" aria-expanded="false" aria-label="Toggle navigation">

<span class="navbar-toggler-icon"></span>

</button>

<!-- navbar -->

<div class="collapse navbar-collapse text-center" id="navbar">

<ul class="navbar-nav ml-auto">

<li class="nav-item">

<a class="nav-link" href="#about">About</a>

</li>

<li class="nav-item">

<a class="nav-link" href="#contact">Contact</a>

</li>

</ul>

<a href="patient/index.php" class="btn btn-primary ml-lg-3 primary-shadow">Patient Login</a>

</div>

</nav>

</div>

</section>

<!-- /navigation -->

<!-- hero area -->

<section class="hero-section hero" data-background=""

style="background-image: url(assets1/images/hero-area/banner-bg.png);">

<div class="container">

<div class="row">

<div class="col-lg-12 text-center zindex-1">

<h1 class="mb-3">Disease Prediction System for COVID with Electronic Medical Records</h1>

<!-- <h3 class="mb-3">We made your medical<br>

Treatment easy</h3> -->

<p class="mb-4">We made your medical<br>

Treatment easy</p>

<a id="contact" href="doctor/index.php" class="btn btn-secondary btn-lg">Doctor Login</a>

</div>

</div>

<br><br><br><br>

<div class="row">

<div class="col-lg-12 text-center">

<h2 class="section-title">Contact</h2>

</div>

</div>

<div class="row contact-bg p-5 rounded mb-5">

<!-- <div class="col-lg-7 mb-4 mb-lg-0"> -->

<!-- <form action="#">

<input type="text" class="form-control mb-3" id="name" name="name" placeholder="Your Name">

<input type="email" class="form-control mb-3" id="mail" name="mail" placeholder="Your Email">

<input type="text" class="form-control mb-3" id="subject" name="subject" placeholder="Subject">

<textarea name="message" id="message" class="form-control mb-3"

placeholder="Your Message"></textarea>

<button type="submit" value="send" class="btn btn-secondary">SEND MESSAGE</buttonid=>

</form> -->

<!-- </div> -->

<!-- <div class="col-lg-5"> -->

<div>

<p class="mb-5 text-center">If you'll like to know more about our experience designing and delivering cloud

solutions, or get advice on your own technology challenges get in touch. With dedicated

engineers on-hand 24/7, we’re set up to become an extension of your team.</p>

<a href="tel:9080844910" class="text-color h5 d-block text-center">+91 9080844910</a>

<a href="mailto:rahd006@gmail.com" class="mb-5 text-color h5 text-center d-block">rahd006@gmail.com</a>

<p id="about" class="text-center">Panimalar Engineering College<br>Chennai</p>

</div>

</div>

<br><br>

<div class="row">

<div class="col-lg-12 text-center">

<h2 class="section-title">About</h2>

</div>

<div class="col-lg-12 mb-100">

<p>This is a Final Year Project to develop a Electronic Medical Records for Hospital Management System.

This application helps us to provide services on time and also accurate solutions for the problems of the organization.</p>

<p>An electronic (digital) collection of medical information about a person that is stored on a computer. An electronic medical record includes information about a patient's health history, such as diagnoses, medicines, tests, allergies, immunizations, and treatment plans.

<br><br> <a class="text-color h5 d-block text-center">Under the Guidance, Project Coordinator of</a>

<a class="text-color h4 d-block text-center">G. Senthil Kumar, M.C.A,. MPhil., M.B.A., M.E., (Ph.D.,),</a>

<a class="text-color h4 d-block text-center">Associate Professor,</a>

<a class="text-color h4 d-block text-center">Department of Computer Science and Engineering,</a>

<a class="text-color h4 d-block text-center">Panimalar Engineering College,</a>

<a class="text-color h4 d-block text-center">Chennai - 600 123.</p></a>

</div>

</div>

</div>

<!-- background shapes -->

<div id="scene">

<img class="img-fluid hero-bg-1 up-down-animation" src="assets1/images/background-shape/feature-bg-2.png"

alt="">

<img class="img-fluid hero-bg-2 left-right-animation" src="assets1/images/background-shape/seo-ball-1.png"

alt="">

<img class="img-fluid hero-bg-3 left-right-animation"

src="assets1/images/background-shape/seo-half-cycle.png" alt="">

<img class="img-fluid hero-bg-4 up-down-animation" src="assets1/images/background-shape/green-dot.png"

alt="">

<img class="img-fluid hero-bg-5 left-right-animation"

src="assets1/images/background-shape/blue-half-cycle.png" alt="">

<img class="img-fluid hero-bg-6 up-down-animation" src="assets1/images/background-shape/seo-ball-1.png"

alt="">

<img class="img-fluid hero-bg-7 left-right-animation"

src="assets1/images/background-shape/yellow-triangle.png" alt="">

<!-- <img class="img-fluid hero-bg-8 up-down-animation"

src="assets1/images/background-shape/service-half-cycle.png" alt=""> -->

<img class="img-fluid hero-bg-9 up-down-animation"

src="assets1/images/background-shape/team-bg-triangle.png" alt="">

</div>

</section>

<!-- /hero-area -->

<!-- jQuery -->

<script src="assets1/plugins/jQuery/jquery.min.js"></script>

<!-- Bootstrap JS -->

<script src="assets1/plugins/bootstrap/bootstrap.min.js"></script>

<!-- slick slider -->

<script src="assets1/plugins/slick/slick.min.js"></script>

<!-- venobox -->

<script src="assets1/plugins/Venobox/venobox.min.js"></script>

<!-- aos -->

<script src="assets1/plugins/aos/aos.js"></script>

<!-- Main Script -->

<script src="assets1/js/script.js"></script>

</body>

<script>

$(document).ready(function() {

// Add smooth scrolling to all links

$("a").on('click', function(event) {

// Make sure this.hash has a value before overriding default behavior

if (this.hash !== "") {

// Prevent default anchor click behavior

event.preventDefault();

// Store hash

var hash = this.hash;

// Using jQuery's animate() method to add smooth page scroll

// The optional number (800) specifies the number of milliseconds it takes to scroll to the specified area

$('html, body').animate({

scrollTop: $(hash).offset().top

}, 1200, function() {

// Add hash (#) to URL when done scrolling (default click behavior)

window.location.hash = hash;

});

} // End if

});

});

</script>

</html>

**DOCTOR PAGE**

**Dashboard**

<?php

session\_start();

include\_once('controller/dbconn.php');

include\_once('includes/header.php');

include\_once('includes/sidebar.php');

include\_once("includes/footer.php");

// $number=20;

$username=ucfirst($\_SESSION["doc"]["name"]);

$timeOfDay = date('a');

if($timeOfDay == 'am'){

$greeting='Good morning';

}else{

$greeting='Good evening';

}

?>

<link rel="stylesheet" type="text/css" href="https://cdn.jsdelivr.net/npm/daterangepicker/daterangepicker.css" />

<title>Dashboard | Doctor</title>

<link rel="stylesheet" href="https://maxcdn.bootstrapcdn.com/bootstrap/4.5.2/css/bootstrap.min.css">

<script src="https://ajax.googleapis.com/ajax/libs/jquery/3.5.1/jquery.min.js"></script>

<script src="https://cdnjs.cloudflare.com/ajax/libs/popper.js/1.16.0/umd/popper.min.js"></script>

<script src="https://maxcdn.bootstrapcdn.com/bootstrap/4.5.2/js/bootstrap.min.js"></script>

<div class="main-content">

<div class="page-content">

<div class="container-fluid">

<!-- start page title -->

<div class="row align-items-center">

<div class="col-sm-6">

<div class="page-title-box">

<!-- <h4 class="font-size-18">Dashboard</h4> -->

<ol class="breadcrumb mb-0">

<!-- <li class="breadcrumb-item active">Welcome to Foox Gro Dashboard</li> -->

</ol>

</div>

<div id="reportrange"

style="background: #fff; cursor: pointer; padding: 5px 10px; border: 1px solid #ccc; width: 100%">

<i class="fa fa-calendar"></i>&nbsp;

<span></span> <i class="fa fa-caret-down"></i>

</div>

</div>

</div>

<div class="row" style="margin-top:10px;">

<div class="col" style="text-align:center;">

<div class="card">

<div class="card-body">

<h5 class="card-title"><?php echo $greeting; ?> <span style="font-weight:bold;"> <?php echo $username; ?> </span></h5>

<p class="card-text">You have <span class="font-weight-bold" id="total-sales"></span> more patients booking today.

</p>

<a href="schedule.php" class="btn btn-primary">View Schedule</a>

</div>

</div>

</div>

</div>

<div class="row">

<div class="col-12">

<div class="card">

<div class="card-body">

<h4 class="card-title"><span class="font-weight-bold">Upcoming patients</span></h4>

<div class="table-responsive">

<div class="live-order-list">

</div>

</div>

</div>

</div>

</div> <!-- end col -->

</div>

<!-- end sample -->

</div>

<!-- end row -->

</div>

</div>

<script type="text/javascript" src="https://cdn.jsdelivr.net/jquery/latest/jquery.min.js"></script>

<script type="text/javascript" src="https://cdn.jsdelivr.net/momentjs/latest/moment.min.js"></script>

<script type="text/javascript" src="https://cdn.jsdelivr.net/npm/daterangepicker/daterangepicker.min.js"></script>

<script>

$(document).ready(function() {

// live share

$(function() {

var value = '<?php echo($sel\_query3[Total1]);?>';

// Toastify({

// text: value + " placed ",

// duration: 3000,

// backgroundColor: "linear-gradient(to right, #00b09b, #96c93d)",

// className: "success",

// }).showToast();

var start = moment().subtract(29, 'days');

var end = moment();

// live share

// live share

function cb(start, end) {

$('#reportrange span').html(start.format('MMMM D, YYYY') + ' - ' + end.format(

'MMMM D, YYYY'));

var starting\_date = start.format('YYYY-MM-DD');

var ending\_date = end.format('YYYY-MM-DD');

total\_sales(starting\_date, ending\_date);

}

$('#reportrange').daterangepicker({

startDate: start,

endDate: end,

ranges: {

'Today': [moment(), moment()],

'Yesterday': [moment().subtract(1, 'days'), moment().subtract(1, 'days')],

'Last 7 Days': [moment().subtract(6, 'days'), moment()],

'Last 30 Days': [moment().subtract(29, 'days'), moment()],

'This Month': [moment().startOf('month'), moment().endOf('month')],

'Last Month': [moment().subtract(1, 'month').startOf('month'), moment()

.subtract(1, 'month').endOf('month')

]

}

}, cb);

cb(start, end);

});

// live share

function total\_sales(starting\_date, ending\_date) {

$.ajax({

type: "POST",

url: "controller/common\_controller.php",

data: {

starting\_date: starting\_date,

ending\_date: ending\_date,

Type: "total\_sales"

},

success: function(result) {

// console.log(result);

$("#total-sales").html(result);

}

});

}

});

</script>

**Appointments**

<?php

include\_once('includes/header.php');

include\_once('includes/sidebar.php');

include\_once("includes/footer.php");

?>

<title>Schedule | Doctor</title>

<div id="layout-wrapper">

<!-- Start right Content here -->

<!-- ============================================================== -->

<div class="main-content">

<div class="page-content">

<div class="container-fluid">

<!-- start page title -->

<div class="row align-items-center">

<div class="col-sm-6">

<div class="page-title-box">

</div>

</div>

<div class=" col-auto float-right ml-auto">

</div>

</div>

<!-- end page title -->

<div class="row">

<div class="col-12">

<div class="card">

<div class="card-body">

<h4 class="card-title">Patient Requests</h4>

<div class="table-responsive">

<div class="live-order-list">

</div>

</div>

</div>

</div>

</div> <!-- end col -->

</div> <!-- end row -->

</div> <!-- container-fluid -->

</div>

<!-- End Page-content -->

</div>

</div>

<script type="text/javascript">

$(document).ready(function() {

show\_current\_list();

setInterval(function() {

show\_current\_list();

}, 4500);

function show\_current\_list() {

$.ajax({

type: "POST",

url: "controller/common\_controller.php",

data: {

Type: "show\_current\_list"

},

success: function(result) {

$(".live-order-list").html(result);

}

});

}

$(document).on("click", ".accept\_btn", function() {

var status = 1;

var appointment\_id = $(this).attr("id");

change\_status(appointment\_id, status);

});

$(document).on("click", ".reject\_btn", function() {

var status = 2;

var appointment\_id = $(this).attr("id");

change\_status(appointment\_id, status);

});

function change\_status(appointment\_id, status) {

$.ajax({

type: "POST",

url: "controller/common\_controller.php",

data: {

status: status,

appointment\_id: appointment\_id,

Type: "change\_appointment"

},

success: function(result) {

show\_current\_list();

}

});

}

});

</script>

**Index**

<!DOCTYPE html>

<html>

<head>

<title>Doctor Login</title>

<link rel="stylesheet" type="text/css" href="style.css">

<link rel="stylesheet" href="https://cdnjs.cloudflare.com/ajax/libs/font-awesome/4.7.0/css/font-awesome.min.css">

<script src="//cdn.jsdelivr.net/npm/sweetalert2@10"></script>

<link rel="shortcut icon" href="../assets/images/favicon.ico">

</head>

<body>

<div class="container" id="container">

<div class="form-container sign-up-container">

<form id="register\_form">

<h1>Create Account</h1>

<div class="social-container">

</div>

<input type="text" name="reg\_name" id="reg\_name" placeholder="Name" autocomplete="off">

<input type="email" name="reg\_email" id="reg\_email" placeholder="Email" autocomplete="off">

<input type="password" name="reg\_password" id="reg\_password" placeholder="Password" autocomplete="off">

<button class="register" id="register">SignUp</button>

</form>

</div>

<div class="form-container sign-in-container">

<form id="login\_form">

<span id="invalid\_details" class="text-danger"></span>

<h1>Sign In</h1>

<div class="social-container">

</div>

<input type="email" name="log\_email" id="log\_email" placeholder="Email" autocomplete="off">

<input type="password" name="log\_password" id="log\_password" placeholder="Password" autocomplete="off">

<a href="#">Forgot Your Password</a>

<button class="login" id="login">Sign In</button>

</form>

</div>

<div class="overlay-container">

<div class="overlay">

<div class="overlay-panel overlay-left">

<h1>Welcome Back!</h1>

<p>To keep connected with us please login with your personal info</p>

<button class="ghost" id="signIn">Sign In</button>

</div>

<div class="overlay-panel overlay-right">

<h1>Hello, Doctor!</h1>

<p>Enter your details and start journey with us</p>

<button class="ghost" id="signUp">Sign Up</button>

</div>

</div>

</div>

</div>

<script src="http://ajax.googleapis.com/ajax/libs/jquery/1.7.1/jquery.min.js" type="text/javascript"></script>

<script src="https://cdnjs.cloudflare.com/ajax/libs/jquery-validate/1.19.2/jquery.validate.min.js"></script>

<script>

const signUpButton = document.getElementById('signUp');

const signInButton = document.getElementById('signIn');

const container = document.getElementById('container');

signUpButton.addEventListener('click', () => {

container.classList.add("right-panel-active");

});

signInButton.addEventListener('click', () => {

container.classList.remove("right-panel-active");

});

$(document).ready(function() {

$("#login\_form").validate({

rules: {

"log\_email": {

required: true

},

"password": {

required: true

},

},

messages: {

"email\_id": {

required: "Please enter email"

},

"password": {

required: "Please enter Password"

},

},

errorElement: 'div',

ignore: ':not(:visible)',

errorPlacement: function(error, element) {

error.insertAfter(element);

}

});

$("#register\_form").validate({

rules: {

"reg\_name": {

required: true

},

"reg\_email": {

required: true

},

"reg\_password": {

required: true

},

},

messages: {

"reg\_name": {

required: "Please enter email"

},

"reg\_email": {

required: "Please enter Password"

},

"reg\_password": {

required: "Please enter Password"

},

},

errorElement: 'div',

ignore: ':not(:visible)',

errorPlacement: function(error, element) {

error.insertAfter(element);

}

});

$("#register").click(function(e) {

e.preventDefault();

$("#register").val("Registering...");

setTimeout(function(){

if ($("#register\_form").valid()) {

var name = $("#reg\_name").val();

var email = $("#reg\_email").val();

var password = $("#reg\_password").val();

// console.log(email, password);

register(name, email, password);

$(this).prop("disabled", true);

// add spinner to button

$(this).html(

` <span class="spinner-border spinner-border-sm" role="status" aria-hidden="true"></span>`

);

}

}, 1500);

});

$("#login").click(function(e) {

e.preventDefault();

$("#login").val("Signing In...");

setTimeout(function(){

if ($("#login\_form").valid()) {

var email = $("#log\_email").val();

var password = $("#log\_password").val();

// console.log(email, password);

login(email, password);

$(this).prop("disabled", true);

// add spinner to button

$(this).html(

` <span class="spinner-border spinner-border-sm" role="status" aria-hidden="true"></span>`

);

}

}, 1500);

});

function register(name, email, password) {

$.ajax({

type: "POST",

url: "controller/common\_controller.php",

data: {

name: name.trim(),

email: email.trim(),

password: password.trim(),

Type: "register"

},

success: function(result) {

Swal.fire({

position: 'top-end',

icon: 'success',

title: 'Register Successful',

showConfirmButton: false,

timer: 1500

})

setTimeout(function(){ location.reload(true); }, 1500);

}

});

}

function login(email, password) {

$.ajax({

type: "POST",

url: "controller/common\_controller.php",

data: {

email: email.trim(),

password: password.trim(),

Type: "login"

},

success: function(result) {

if (result == 1) {

window.location = "dashboard.php";

} else {

Swal.fire({

icon: 'error',

title: 'Oops...',

text: 'Invalid Password!'

})

$("#login").val("SIGN IN");

}

}

});

}

});

</script>

</body>

</html>

**Patient history**

<?php

include\_once('includes/header.php');

include\_once('includes/sidebar.php');

include\_once("includes/footer.php");

?>

<title>History | Doctor</title>

<div id="layout-wrapper">

<!-- Start right Content here -->

<!-- ============================================================== -->

<div class="main-content">

<div class="page-content">

<div class="container-fluid">

<!-- start page title -->

<div class="row align-items-center">

<div class="col-sm-6">

<div class="page-title-box">

</div>

</div>

<div class="col-auto float-right ml-auto">

</div>

</div>

<!-- end page title -->

<div class="row">

<div class="col-12">

<div class="card">

<div class="card-body">

<h4 class="card-title">Patient History</h4>

<div class="table-responsive">

<div class="live-order-list">

</div>

</div>

</div>

</div>

</div> <!-- end col -->

</div> <!-- end row -->

</div> <!-- container-fluid -->

</div>

<!-- End Page-content -->

</div>

</div>

<script type="text/javascript">

$(document).ready(function() {

show\_patient\_history();

function show\_patient\_history() {

$.ajax({

type: "POST",

url: "controller/common\_controller.php",

data: {

Type: "show\_patient\_history"

},

success: function(result) {

$(".live-order-list").html(result);

}

});

}

});

</script>

**DB connection**

<?php

/\*$username = "root";

$password = "mysql";

$servername = "localhost";

$dbconn=mysqli\_connect("localhost","root","mysql","afh");

// Check connection

if (mysqli\_connect\_errno())

{

echo "Failed to connect to MySQL: " . mysqli\_connect\_error();

}\*/

ini\_set("display\_errors", "Off");

/\* ============================================================= \*/

/\* ==============Connects to the DB============================= \*/

function db\_connect() {

$dbhost = 'localhost';

$dbusername = 'root';

$database = 'emr';

$dbuserpassword = '';

// $dbhost = 'bm5yzmft28ph1gw4zio2-mysql.services.clever-cloud.com';

// $dbusername = 'ub0kopxjm61lm4z1';

// $database = 'bm5yzmft28ph1gw4zio2';

// $dbuserpassword = 'ub0kopxjm61lm4z1';

$connection = mysqli\_connect($dbhost, $dbusername, $dbuserpassword, $database);

// mysql\_select\_db($database) or die( "Unable to select database");

return $connection;

}

/\* \_-\_-\_-\_-\_-\_-\_-\_-\_-\_-\_-\_-\_-\_-\_-\_-\_-\_-\_-\_-\_-\_-\_-\_-\_-\_-\_-\_-\_-\_- \*/

/\* ============================================================= \*/

/\* ===Performs an SQL query and returns the result in an array== \*/

function return\_array($query) {

$connection = db\_connect();

$exec = mysqli\_query($connection, $query);

$querydata = array();

while ($data = mysqli\_fetch\_array($exec))

$querydata[] = $data;

echo mysqli\_error($connection);

return $querydata;

}

/\* =======Performs an SQL query with a query as an argument===== \*/

function gosql($query) {

$connection = db\_connect();

$exec = mysqli\_query($connection, $query);

return $exec;

}

function gosql1($query) {

$connection = db\_connect();

$exec = mysqli\_query($connection, $query);

$id = mysqli\_insert\_id($connection);

return $id;

}

function insert($query, $id) {

$connection = db\_connect();

$table = array\_shift($query);

$cols = mysqli\_query($connection, "SHOW COLUMNS from $table");

$message = array();

while ($row = mysqli\_fetch\_assoc($cols)) {

// if ($row['Null'] == "NO") {

if ($row['Null'] == "NO") {

if ($row['Default'] == '') {

if ($row['Extra'] == '') {

if ($query[$row['Field']] == '') {

$message['response'] = 'fail';

$message[$row['Field']] = "Please enter the " . $row['Field'];

}

}

}

}

// }

}

if ($message) {

echo "<pre>";

print\_r($message);

exit;

return $message;

} else {

if ($id) {

$cnt = count($query);

$sql = "update $table set ";

$i = 1;

foreach ($query as $key => $value) {

if ($cnt == $i) {

$sql .= $key . "='" . $value . "' ";

} else {

$sql .= $key . "='" . $value . "', ";

}

$i++;

}

$sql .= " where id=$id";

// echo $sql;exit;

$exec = mysqli\_query($connection, $sql);

$message['response'] = "Save Successfully";

$message['id'] = "$id";

return $message;

} else {

$keys = implode(",", array\_keys($query));

$values = "'" . implode("','", $query) . "'";

$sql = "insert into $table($keys) values($values)";

$exec = mysqli\_query($connection, $sql);

$id = mysqli\_insert\_id($connection);

$message['response'] = "Save Successfully";

$message['id'] = "$id";

return $message;

}

}

}

/\* \_-\_-\_-\_-\_-\_-\_-\_-\_-\_-\_-\_-\_-\_-\_-\_-\_-\_-\_-\_-\_-\_-\_-\_-\_-\_-\_-\_-\_-\_- \*/

/\* ============================================================= \*/

/\* ===Performs an SQL query and returns the result in an array== \*/

function return\_single($query) {

$connection = db\_connect();

$exec = mysqli\_query($connection, $query);

while ($data = mysqli\_fetch\_assoc($exec)) {

$querydata[] = $data;

}

return $querydata[0];

}

/\* ============================================================= \*/

/\* ===Performs an SQL query and returns the result in an array== \*/

function return\_record($query) {

$connection = db\_connect();

$exec = mysqli\_query($connection, $query);

while ($data = mysqli\_fetch\_array($exec))

$querydata = $data;

echo mysql\_error($connection);

return $querydata;

}

/\* ============================================================= \*/

function filter\_field($field) {

$connection = db\_connect();

// Stripslashes

if (get\_magic\_quotes\_gpc())

$field = stripslashes($field);

$field = mysqli\_real\_escape\_string($connection, htmlspecialchars($field));

return $field;

}

function slug($tablename, $id, $string, $replace = array(), $delimiter = '-') {

$connection = db\_connect();

$oldLocale = setlocale(LC\_ALL, '0');

setlocale(LC\_ALL, 'en\_US.UTF-8');

$clean = iconv('UTF-8', 'ASCII//TRANSLIT', $string);

if (!empty($replace)) {

$clean = str\_replace((array) $replace, ' ', $clean);

}

$clean = preg\_replace("/[^a-zA-Z0-9\/\_|+ -]/", '', $clean);

$clean = strtolower($clean);

$clean = preg\_replace("/[\/\_|+ -]+/", $delimiter, $clean);

$clean = trim($clean, $delimiter);

setlocale(LC\_ALL, $oldLocale);

$slugs = "SELECT slug FROM $tablename WHERE slug = '" . $clean . "' AND id !=$id";

$obj = return\_array($slugs);

if ($obj) {

$clean = $clean;

// $clean = $clean . '-' . $id;

} else {

$clean = $clean;

}

$slugsupdate = "UPDATE $tablename SET slug = '" . $clean . "' WHERE id =" . $id;

mysqli\_query($connection, $slugsupdate);

return $clean;

}

?>

**Logout**

<?php

session\_start();

// include\_once('controller/dbconn.php');

// date\_default\_timezone\_set("Asia/Kolkata");

// $logoutTym=gosql("UPDATE `login` SET `logout\_tym`= '".date("Y-m-d H:i:s")."' WHERE `username`= '".$\_SESSION["Admin"]["username"]."';");

//Free session variables

// session\_unset();

// destroy the session

session\_destroy();

unset($\_SESSION["Admin"]);

header("Location:index.php");

?>

**PATIENT**

**Dashboard**

<?php

session\_start();

include\_once('controller/dbconn.php');

include\_once('includes/header.php');

include\_once('includes/sidebar.php');

include\_once("includes/footer.php");

// $number=20;

$username=ucfirst($\_SESSION["pat"]["name"]);

$efficient\_data=$\_SESSION["pat"]["efficient\_data"];

$timeOfDay = date('a');

if($timeOfDay == 'am'){

$greeting='Good morning';

}else{

$greeting='Good evening';

}

?>

<link rel="stylesheet" type="text/css" href="https://cdn.jsdelivr.net/npm/daterangepicker/daterangepicker.css" />

<title>Dashboard | <?php echo $username;?></title>

<link rel="stylesheet" href="https://maxcdn.bootstrapcdn.com/bootstrap/4.5.2/css/bootstrap.min.css">

<script src="https://ajax.googleapis.com/ajax/libs/jquery/3.5.1/jquery.min.js"></script>

<script src="https://cdnjs.cloudflare.com/ajax/libs/popper.js/1.16.0/umd/popper.min.js"></script>

<script src="https://maxcdn.bootstrapcdn.com/bootstrap/4.5.2/js/bootstrap.min.js"></script>

<div class="main-content">

<div class="page-content">

<div class="container-fluid">

<!-- start page title -->

<div class="row align-items-center">

<div class="col-sm-6">

<div class="page-title-box">

<ol class="breadcrumb mb-0">

<!-- <li class="breadcrumb-item active">Welcome to Foox Gro Dashboard</li> -->

</ol>

</div>

<div id="reportrange"

style="background: #fff; cursor: pointer; padding: 5px 10px; border: 1px solid #ccc; width: 100%">

<i class="fa fa-calendar"></i>&nbsp;

<span></span> <i class="fa fa-caret-down"></i>

</div>

</div>

</div>

<div class="row" style="margin-top:10px;">

<div class="col" style="text-align:center;">

<?php if($efficient\_data==0){ ?>

<div class="alert alert-danger" role="alert">

Details Not Updated. Please visit <a href="./account.php">My account</a> to update your details

</div>

<?php } ?>

<div class="card">

<div class="card-body">

<h5 class="card-title"><?php echo $greeting; ?> <span style="font-weight:bold;">

<?php echo $username; ?> </span></h5>

<p class="card-text">You have <span class="font-weight-bold" id="total-sales"></span> more

patients booking today.

</p>

<a href="schedule.php" class="btn btn-primary">View Schedule</a>

</div>

</div>

</div>

</div>

<div class="row">

<div class="col-12">

<div class="card">

<div class="card-body">

<h4 class="card-title"><span class="font-weight-bold">Upcoming patients</span></h4>

<div class="table-responsive">

<div class="live-order-list">

</div>

</div>

</div>

</div>

</div> <!-- end col -->

</div>

<!-- end sample -->

</div>

<!-- end row -->

</div>

</div>

<script type="text/javascript" src="https://cdn.jsdelivr.net/jquery/latest/jquery.min.js"></script>

<script type="text/javascript" src="https://cdn.jsdelivr.net/momentjs/latest/moment.min.js"></script>

<script type="text/javascript" src="https://cdn.jsdelivr.net/npm/daterangepicker/daterangepicker.min.js"></script>

<script>

$(document).ready(function() {

// live share

$(function() {

var value = '<?php echo($sel\_query3[Total1]);?>';

// Toastify({

// text: value + " placed ",

// duration: 3000,

// backgroundColor: "linear-gradient(to right, #00b09b, #96c93d)",

// className: "success",

// }).showToast();

var start = moment().subtract(29, 'days');

var end = moment();

// live share

// live share

function cb(start, end) {

$('#reportrange span').html(start.format('MMMM D, YYYY') + ' - ' + end.format(

'MMMM D, YYYY'));

var starting\_date = start.format('YYYY-MM-DD');

var ending\_date = end.format('YYYY-MM-DD');

total\_sales(starting\_date, ending\_date);

}

$('#reportrange').daterangepicker({

startDate: start,

endDate: end,

ranges: {

'Today': [moment(), moment()],

'Yesterday': [moment().subtract(1, 'days'), moment().subtract(1, 'days')],

'Last 7 Days': [moment().subtract(6, 'days'), moment()],

'Last 30 Days': [moment().subtract(29, 'days'), moment()],

'This Month': [moment().startOf('month'), moment().endOf('month')],

'Last Month': [moment().subtract(1, 'month').startOf('month'), moment()

.subtract(1, 'month').endOf('month')

]

}

}, cb);

cb(start, end);

});

// live share

function total\_sales(starting\_date, ending\_date) {

$.ajax({

type: "POST",

url: "controller/common\_controller.php",

data: {

starting\_date: starting\_date,

ending\_date: ending\_date,

Type: "total\_sales"

},

success: function(result) {

// console.log(result);

$("#total-sales").html(result);

}

});

}

});

</script>

**Account**

<?php

session\_start();

include\_once('controller/dbconn.php');

include\_once('includes/header.php');

include\_once('includes/sidebar.php');

include\_once("includes/footer.php");

$username=ucfirst($\_SESSION["pat"]["name"]);

$id=$\_SESSION["pat"]["Id"];

$email=$\_SESSION["pat"]["email"];

?>

<title>Account | <?php echo $username;?></title>

<link rel="stylesheet" href="https://maxcdn.bootstrapcdn.com/bootstrap/4.5.2/css/bootstrap.min.css">

<title>Profile</title>

<div id="layout-wrapper">

<div class="main-content">

<div class="page-content">

<div class="container-fluid">

<div class="row align-items-center">

<div class="col-sm-6">

<div class="page-title-box">

<h3 class="font-size-28">Profile</h3>

<ol class="breadcrumb mb-0">

<!-- <li class="breadcrumb-item"><a href="javascript: void(0);">Home</a></li>

<li class="breadcrumb-item"><a href="javascript: void(0);">View Profile</a></li> -->

</ol>

</div>

</div>

<div class="col-auto float-right ml-auto">

<div>

<a href="#" class="btn add-btn btn-primary edit\_customer" data-toggle="modal"

data-target="#edit\_customers"><i class="fa fa-pen"></i> Edit Profile</a>

</div>

</div>

</div>

<div class="row">

<div class="col-12">

<div class="card">

<div class="card-body">

<table id="view\_profile" class="table mb-0 table-bordered dt-responsive nowrap">

<tbody>

<?php

$count=1;

$sel\_query="SELECT \* FROM `patient\_det` WHERE name = '".$username."'";

$result = return\_array($sel\_query);

foreach($result as $row) { ?>

<tr>

<td><b>NAME</b></td>

<td><?php echo $username; ?>

</td>

</tr>

<tr>

<td><b>EMAIL</b></td>

<td><?php echo $row["email"]; ?></td>

</tr>

<tr>

<td><b>AGE</b></td>

<td><?php if($row["age"]=='0'){print("-");}else{

echo $row["age"];

} ?></td>

</tr>

<tr>

<td><b>GENDER</b></td>

<td><?php if($row["gender"]=='1'){

echo Male;

}else if($row["gender"]=='2'){

echo Female;

} else{

print("-");

} ?>

</td>

</tr>

<tr>

<td><b>PHONE NUMBER</b></td>

<td>+91 <?php if($row["ph\_number"]=='0'){print("-");}else{

echo $row["ph\_number"];

} ?>

</td>

</tr>

<tr>

<td><b>HEIGHT</b></td>

<td><?php if($row["height"]=='0'){print("-");}else{

echo $row["height"];

} ?> feet

</td>

</tr>

<tr>

<td><b>WEIGHT</b></td>

<td><?php if($row["weight"]=='0'){print("-");}else{

echo $row["weight"];

} ?> Kg

</td>

</tr>

<?php } ?>

</tbody>

</table>

</div>

</div>

</div>

<!--end col-->

<div id="edit\_customers" class="modal custom-modal fade" role="dialog">

<div class="modal-dialog modal-dialog-scrollable modal-lg">

<div class="modal-content">

<div class="modal-header">

<h5 class="modal-title">Edit</h5>

<button type="button" class="close" data-dismiss="modal" aria-label="Close">

<span aria-hidden="true">&times;</span>

</button>

</div>

<!-- modal================== -->

<div class="modal-body">

<form id="customer\_form" style="align:center;" class="customer\_form"

name="customer\_form">

<div class="row">

<div class="col-lg-6">

<div>

<div class="form-group mb-4">

<label for="venture\_name">Name</label>

<input type="text" class="form-control" name="venture\_name"

value="<?php echo $get\_role["venture\_name"];?>"

id="venture\_name" placeholder="<?php echo $username; ?>"

autocomplete="off" disabled>

</div>

<div class="form-group mb-4">

<label for="age">Age</label>

<input type="number" class="form-control" name="age"

id="age" placeholder="Enter Age" min="1" max="130" autocomplete="off">

</div>

<input type="hidden" name="hidid" id="hidid" class="hidid" />

<div class="form-group mb-4">

<label for="zone">Gender</label>

<select id="gender" class="form-control">

<option value="0">Select</option>

<option value="1">Male</option>

<option value="2">Female</option>

</select>

</div>

</div>

</div>

<div class="col-lg-6">

<div class="form-group mb-4">

<label for="ph\_number">Phone Number</label>

<input type="text" class="form-control" name="ph\_number"

id="ph\_number" placeholder="Enter phone number"

autocomplete="off">

</div>

<div class="form-group mb-4">

<label for="height">Height</label>

<input type="number" class="form-control" name="height" id="height"

placeholder="Enter height(feet)" autocomplete="off">

</div>

<div class=" password form-group mb-4">

<label for="weight">Weight</label>

<input type="number" class="form-control" name="weight" id="weight"

placeholder="Enter weight(Kg s)" autocomplete="off">

</div>

<!-- <span id="phone-availability-status"></span></label>

<span id="phone\_validate" class="r"></span></label> -->

</div>

<div class="form-group mb-4">

<button class="btn btn-primary w-md waves-effect waves-light"

id="edit\_btn">Edit

</button>

</div>

</div>

</div>

<!-- <div id="hide-div" class="form-group row">

<div class="col-md-12">

<button class="btn btn-primary w-md waves-effect waves-light" id="edit">Edit

</button>

</div>

</div> -->

</div>

</div>

</div>

</form>

</div>

</div>

</div>

</div>

</div>

</div>

<script src="https://ajax.googleapis.com/ajax/libs/jquery/3.5.1/jquery.min.js"></script>

<script src="https://cdnjs.cloudflare.com/ajax/libs/popper.js/1.16.0/umd/popper.min.js"></script>

<script src="https://maxcdn.bootstrapcdn.com/bootstrap/4.5.2/js/bootstrap.min.js"></script>

<script>

$(document).ready(function() {

$(".edit\_customer").click(function() {

var userid = "<?php echo $id; ?>";

call\_edit\_page(userid);

});

function call\_edit\_page(user\_id) {

$.ajax({

type: "POST",

url: "controller/common\_controller.php",

data: {

user\_id: user\_id,

Type: "fetch\_customer\_details"

},

success: function(result) {

var res1 = JSON.parse(result);

$("#age").val(res1.age);

$("#gender").val(res1.gender);

$("#ph\_number").val(res1.ph\_number);

$("#height").val(res1.height);

$("#weight").val(res1.weight);

}

});

}

$("#edit\_btn").click(function(e) {

e.preventDefault();

var id=<?php echo $id; ?>;

var age = $("#age").val();

var gender=0;

var gender = $("#gender").val();

var ph\_number = $("#ph\_number").val();

var height = $("#height").val();

var weight = $("#weight").val();

register(id,age,gender,ph\_number,height,weight);

});

function register(id,age,gender,ph\_number,height,weight) {

$.ajax({

type: "POST",

url: "controller/common\_controller.php",

data: {

id: id,

age:age.trim(),

gender:gender,

ph\_number:ph\_number.trim(),

height:height.trim(),

weight:weight.trim(),

Type: "edit\_profile"

},

success: function(result) {

window.location.reload();

}

});

}

});

</script>

**History**

<?php

session\_start();

include\_once('controller/dbconn.php');

include\_once('includes/header.php');

include\_once('includes/sidebar.php');

include\_once("includes/footer.php");

$username=ucfirst($\_SESSION["pat"]["name"]);

?>

<title>History | <?php echo $username;?></title>

<link rel="stylesheet" href="https://maxcdn.bootstrapcdn.com/bootstrap/4.5.2/css/bootstrap.min.css">

<script src="https://ajax.googleapis.com/ajax/libs/jquery/3.5.1/jquery.min.js"></script>

<script src="https://cdnjs.cloudflare.com/ajax/libs/popper.js/1.16.0/umd/popper.min.js"></script>

<script src="https://maxcdn.bootstrapcdn.com/bootstrap/4.5.2/js/bootstrap.min.js"></script>

<div id="layout-wrapper">

<!-- Start right Content here -->

<!-- ============================================================== -->

<div class="main-content">

<div class="page-content">

<div class="container-fluid">

<!-- start page title -->

<div class="row align-items-center">

<div class="col-sm-6">

<div class="page-title-box">

<input type="hidden" name="hidid" id="hidid" class="hidid" value="<?php echo $\_SESSION["pat"]["pat\_id"];?>">

</div>

</div>

<div class="col-auto float-right ml-auto">

</div>

</div>

<!-- end page title -->

<div class="row">

<div class="col-12">

<div class="card">

<div class="card-body">

<h4 class="card-title">Patient History</h4>

<div class="table-responsive">

<div class="live-order-list">

</div>

</div>

</div>

</div>

</div> <!-- end col -->

</div> <!-- end row -->

</div> <!-- container-fluid -->

</div>

<!-- End Page-content -->

</div>

</div>

<script type="text/javascript">

$(document).ready(function() {

var pat\_id=$("#hidid").val();

show\_patient\_history();

setInterval(function(){ show\_patient\_history(); }, 3000);

function show\_patient\_history() {

$.ajax({

type: "POST",

url: "controller/common\_controller.php",

data: {

pat\_id:pat\_id,

Type: "show\_patient\_history"

},

success: function(result) {

// if(result.isEmpty()==1){

// $(".live-order-list").html("No appointments previously had");

// }else{

$(".live-order-list").html(result);

// }

// var typo=result.isEmpty();

// alert(typo);

}

});

}

});

</script>

**Schedule**

<?php

session\_start();

include\_once('controller/dbconn.php');

include\_once('includes/header.php');

include\_once('includes/sidebar.php');

include\_once("includes/footer.php");

$username=ucfirst($\_SESSION["pat"]["name"]);

?>

<title>Schedule | <?php echo $username;?></title>

<link rel="stylesheet" href="https://maxcdn.bootstrapcdn.com/bootstrap/4.5.2/css/bootstrap.min.css">

<script src="https://ajax.googleapis.com/ajax/libs/jquery/3.5.1/jquery.min.js"></script>

<script src="https://cdnjs.cloudflare.com/ajax/libs/popper.js/1.16.0/umd/popper.min.js"></script>

<link rel="stylesheet" type="text/css" href="https://cdn.jsdelivr.net/npm/toastify-js/src/toastify.min.css">

<script src="https://maxcdn.bootstrapcdn.com/bootstrap/4.5.2/js/bootstrap.min.js"></script>

<div class="main-content">

<div class="page-content">

<div class="container-fluid">

<div class="row align-items-center">

<div class="col-sm-6">

<div class="page-title-box">

<ol class="breadcrumb mb-0">

<!-- <li class="breadcrumb-item active">Welcome to Foox Gro Dashboard</li> -->

</ol>

</div>

</div>

</div>

<div class="row" style="margin-top:10px;">

<div class="col" style="text-align:center;">

<div class="card">

<div class="card-body">

<h5 class="card-title"><span style="font-weight:bold;">

Book Appointment</span></h5>

<p class="card-text"> <input class="form-control" type="datetime-local" id="book\_date"

name="book\_date">

</p>

<button class="btn btn-primary" id="req">Send Request</button>

</div>

</div>

</div>

</div>

<div class="row">

<div class="col-12">

<div class="card">

<div class="card-body">

<h4 class="card-title"><span class="font-weight-bold">Appointments</span></h4>

<div class="table-responsive">

<div class="live-order-list">

</div>

</div>

</div>

</div>

</div> <!-- end col -->

</div>

<!-- end sample -->

</div>

<!-- end row -->

</div>

</div>

<script type="text/javascript" src="https://cdn.jsdelivr.net/jquery/latest/jquery.min.js"></script>

<script type="text/javascript" src="https://cdn.jsdelivr.net/momentjs/latest/moment.min.js"></script>

<script type="text/javascript" src="https://cdn.jsdelivr.net/npm/toastify-js"></script>

<script type="text/javascript" src="https://cdn.jsdelivr.net/npm/daterangepicker/daterangepicker.min.js"></script>

<script>

$(document).ready(function() {

var id = "<?php echo $\_SESSION["pat"]["pat\_id"];?>";

show\_current\_list();

setInterval(function() {

show\_current\_list();

}, 4500);

var todaysDate = new Date();

var year = todaysDate.getFullYear();

var month = ("0" + (todaysDate.getMonth() + 1)).slice(-2);

var day = ("0" + todaysDate.getDate()).slice(-2);

var minDate = (year + "-" + month + "-" + day + "T08:30");

$("#book\_date").attr('min', minDate);

$(document).on("click", "#req", function() {

var book\_date = $("#book\_date").val();

$.ajax({

type: "POST",

url: "controller/common\_controller.php",

data: {

book\_date: book\_date,

id: id,

Type: "patient\_req\_entry"

},

success: function(result) {

show\_current\_list();

Toastify({

text: "Appointment Booked",

backgroundColor: "linear-gradient(to right, #00b09b, #96c93d)",

className: "info",

}).showToast();

$("#book\_date").val("");

// setTimeout(function() {

// location.reload(true);

// }, 1500);

}

});

});

function show\_current\_list() {

$.ajax({

type: "POST",

url: "controller/common\_controller.php",

data: {

id: id,

Type: "show\_patient\_appoint\_list"

},

success: function(result) {

$(".live-order-list").html(result);

}

});

}

});

</script>

**Predict**

<?php

session\_start();

include\_once('controller/dbconn.php');

include\_once('includes/header.php');

include\_once('includes/sidebar.php');

include\_once("includes/footer.php");

$username=ucfirst($\_SESSION["pat"]["name"]);

?>

<title>Prediction | <?php echo $username;?></title>

<link rel="stylesheet" href="https://maxcdn.bootstrapcdn.com/bootstrap/4.5.2/css/bootstrap.min.css">

<script src="https://ajax.googleapis.com/ajax/libs/jquery/3.5.1/jquery.min.js"></script>

<script src="https://cdnjs.cloudflare.com/ajax/libs/popper.js/1.16.0/umd/popper.min.js"></script>

<link rel="stylesheet" type="text/css" href="https://cdn.jsdelivr.net/npm/toastify-js/src/toastify.min.css">

<script src="https://maxcdn.bootstrapcdn.com/bootstrap/4.5.2/js/bootstrap.min.js"></script>

<div class="main-content">

<div class="page-content">

<div class="container-fluid">

<div class="row align-items-center">

<div class="col-sm-6">

<div class="page-title-box">

<ol class="breadcrumb mb-0">

</ol>

</div>

</div>

</div>

<!-- <div class="row" style="margin-top:10px;">

<div class="col" style="text-align:center;">

<div class="card">

<div class="card-body">

<iframe src="https://xraydetectioncovid19.herokuapp.com/" width="600" style="border:none;" height="400">

</iframe>

</div>

</div>

</div>

</div> -->

<div id="heart\_modal" class="modal custom-modal fade" role="dialog">

<div class="modal-dialog modal-dialog-centered modal-lg">

<div class="modal-content">

<div class="modal-header">

<h5 class="modal-title">Add Items</h5>

<button type="button" class="close" data-dismiss="modal" aria-label="Close">

<span aria-hidden="true">&times;</span>

</button>

</div>

<div class="modal-body text-center">

<iframe src="http://127.0.0.1:7132/" width="600" style="border:none;" height="400">

</iframe>

</div>

</div>

</div>

</div>

<div id="covid\_modal" class="modal custom-modal fade" role="dialog">

<div class="modal-dialog modal-dialog-centered modal-lg">

<div class="modal-content">

<div class="modal-header">

<h5 class="modal-title">Add Items</h5>

<button type="button" class="close" data-dismiss="modal" aria-label="Close">

<span aria-hidden="true">&times;</span>

</button>

</div>

<div class="modal-body text-center">

<iframe src="https://xraydetectioncovid19.herokuapp.com/" width="600" style="border:none;" height="400">

</iframe>

</div>

</div>

</div>

</div>

<div id="diabetes\_modal" class="modal custom-modal fade" role="dialog">

<div class="modal-dialog modal-dialog-centered modal-lg">

<div class="modal-content">

<div class="modal-header">

<h5 class="modal-title">Add Items</h5>

<button type="button" class="close" data-dismiss="modal" aria-label="Close">

<span aria-hidden="true">&times;</span>

</button>

</div>

<div class="modal-body text-center">

<iframe src="http://127.0.0.1:8132/" width="600" style="border:none;" height="400">

</iframe>

</div>

</div>

</div>

</div>

<div id="pneumonia\_modal" class="modal custom-modal fade" role="dialog">

<div class="modal-dialog modal-dialog-centered modal-lg">

<div class="modal-content">

<div class="modal-header">

<h5 class="modal-title">Add Items</h5>

<button type="button" class="close" data-dismiss="modal" aria-label="Close">

<span aria-hidden="true">&times;</span>

</button>

</div>

<div class="modal-body text-center">

<iframe src="http://127.0.0.1:9176/" width="600" style="border:none;" height="400">

</iframe>

</div>

</div>

</div>

</div>

<div class="row">

<div class="col-lg-6">

<div class="card">

<div class="card-body text-center">

<h4 class="card-title">COVID-19 Prediction</h4>

<p class="card-title-desc"><code class="highlighter-rouge">Algorithm Used :</code> CNN<br>

<code class="highlighter-rouge">Accuracy :</code> 91%

</p>

<button class="btn btn-md btn-primary" data-toggle="modal" data-target="#covid\_modal"> Predict</button>

</div>

</div>

</div>

<div class="col-lg-6">

<div class="card">

<div class="card-body text-center">

<h4 class="card-title">Diabetes Prediction</h4>

<p class="card-title-desc"><code class="highlighter-rouge">Algorithm Used :</code> Random Forest<br>

<code class="highlighter-rouge">Accuracy :</code> 81%

</p>

<button class="btn btn-md btn-primary" data-toggle="modal" data-target="#diabetes\_modal"> Predict</button>

</div>

</div>

</div>

</div>

<div class="row">

<div class="col-lg-6">

<div class="card">

<div class="card-body text-center">

<h4 class="card-title">Heart Disease Prediction</h4>

<p class="card-title-desc">

<code class="highlighter-rouge">Algorithm Used :</code> Random Forest<br>

<code class="highlighter-rouge">Accuracy :</code> 81%

</p>

<button class="btn btn-md btn-primary" id="heart" data-toggle="modal" data-target="#heart\_modal"> Predict</button>

</div>

</div>

</div>

<div class="col-lg-6">

<div class="card">

<div class="card-body text-center">

<h4 class="card-title">Pneumonia Predection</h4>

<p class="card-title-desc">

<code class="highlighter-rouge">Algorithm Used :</code> CNN<br>

<code class="highlighter-rouge">Accuracy :</code> 86%

</p>

<button class="btn btn-md btn-primary" data-toggle="modal" data-target="#pneumonia\_modal"> Predict</button>

</div>

</div>

</div>

</div>

</div>

</div>

</div>

</div>

<script type="text/javascript" src="https://cdn.jsdelivr.net/jquery/latest/jquery.min.js"></script>

**Common Controller**

<?php

include\_once('dbconn.php');

$type = $\_REQUEST['Type'];

session\_start();

if($type == 'register'){

$password=md5($\_REQUEST["password"]);

$add\_category = gosql("INSERT INTO patient\_det (pat\_id,name,password,email) VALUES ('".$\_REQUEST["pat\_id"]."','".$\_REQUEST["name"]."','".$password."','".$\_REQUEST["email"]."')");

}

else if($type=="total\_sales"){

$start\_date=$\_REQUEST["starting\_date"];

$end\_date=$\_REQUEST["ending\_date"];

$sel\_query=return\_single("SELECT sum(price) as price,sum(gst\_value) as gst,sum(total\_price) as total FROM `orders` WHERE date(createdon) BETWEEN '$start\_date' AND '$end\_date';");

if($sel\_query["total"]!=0){

echo($sel\_query["total"]);

}else{

echo 0;

}

}

else if($type == 'edit\_profile'){

$update\_item = gosql("UPDATE patient\_det SET age='".$\_REQUEST["age"]."',gender='".$\_REQUEST["gender"]."',ph\_number='".$\_REQUEST["ph\_number"]."',height='".$\_REQUEST["height"]."',weight='".$\_REQUEST["weight"]."' WHERE id='".$\_REQUEST["id"]."';");

}

else if($type =='fetch\_customer\_details')

{

$id = $\_REQUEST["user\_id"];

$fetch\_customer = return\_single("SELECT \* from `patient\_det` where id = '".$id."'");

echo json\_encode($fetch\_customer);

}

else if($type=='show\_patient\_history'){

$pat\_id=$\_REQUEST["pat\_id"];?>

<table id="datatable" class="table table-bordered dt-responsive nowrap"

style="border-collapse: collapse; border-spacing: 0; width: 100%;">

<thead>

<tr>

<th>Patient ID</th>

<th>Patient Name</th>

<th>Time</th>

</tr>

</thead>

<tbody>

<?php

$sel\_query="SELECT appointment.id,patient\_det.pat\_id,patient\_det.name AS name,appointment.book\_time AS date\_time FROM `appointment`,`patient\_det` WHERE patient\_det.pat\_id=appointment.pat\_id AND book\_time < CURDATE() AND appointment.pat\_id='".$pat\_id."' ORDER BY appointment.book\_time DESC";

$result = return\_array($sel\_query);

foreach($result as $row) {?>

<tr class="count\_row">

<td align="center"><?php echo $row["pat\_id"]; ?></td>

<td align="center"><?php echo ucfirst($row["name"]); ?></td>

<td align="center"><?php

$del\_date=date\_create($row["date\_time"]);

echo(date\_format($del\_date,"d/m/Y :: h:m:s")); ?></td>

</tr>

<?php } ?>

</tbody>

</table>

<script src="../assets/js/pages/datatables.init.js"></script>

<?php

}

else if($type=='patient\_req\_entry'){

$pat\_id=$\_REQUEST["id"];

$insert\_entry = gosql("INSERT INTO appointment (pat\_id,book\_time) VALUES ('".$pat\_id."','".$\_REQUEST["book\_date"]."')");

echo $pat\_id;

}

else if($type=='show\_patient\_appoint\_list'){

$pat\_id=$\_REQUEST["id"];

$status\_common = array("0"=>"Pending","1"=>"Accepted","2"=>"Rejected");

?>

<table id="datatable" class="table table-bordered dt-responsive nowrap"

style="border-collapse: collapse; border-spacing: 0; width: 100%;">

<thead>

<tr>

<th>Patient ID</th>

<th>Time</th>

<th>Appointment Status</th>

</tr>

</thead>

<tbody>

<?php

$count=1;

$sel\_query="SELECT \* FROM `appointment` WHERE pat\_id='".$pat\_id."' ORDER BY appointment.book\_time DESC";

$result = return\_array($sel\_query);

foreach($result as $row) {

if($row['status']==0){

$status\_color='#ffc107';

}else if($row['status']==1){

$status\_color='#0EB03E';

}else if($row['status']==2){

$status\_color='#F7344C';

}

?>

<tr class="count\_row">

<td align="center"><?php echo $row["pat\_id"]; ?></td>

<td align="center"><?php $del\_date=date\_create($row["book\_time"]); echo(date\_format($del\_date,"d/m/Y :: h:m:s")); ?></td>

<td align="center"><a style="background:<?php echo $status\_color;?>;" class="success btn text-white change\_status"><?php echo $status\_common[$row["status"]];?></a></td>

</tr>

<?php } ?>

</tbody>

</table>

<script src="../assets/js/pages/datatables.init.js"></script>

<?php

}

else if($type == 'login'){

$username = $\_REQUEST['email'];

$password = md5($\_REQUEST['password']);

$check\_cnt = return\_single("SELECT COUNT(1) as cid FROM patient\_det WHERE email = '".$username."'");

if($check\_cnt['cid'] > 0){

$sfqry = "SELECT \* FROM patient\_det WHERE email='".$username."' and password='".$password."'";

$row1 = return\_single($sfqry);

if($row1)

{

$\_SESSION["pat"]["Id"] = $row1["id"];

$\_SESSION["pat"]["pat\_id"] = $row1["pat\_id"];

$\_SESSION["pat"]["name"] = $row1["name"];

$\_SESSION["pat"]["email"] = $row1["email"];

$\_SESSION["pat"]["logged\_in"] = true;

$\_SESSION["pat"]["efficient\_data"]=0;

if($row1["age"]!='0' && $row1["gender"]!='0' && $row1["ph\_number"]!='0' && $row1["height"]!='0' && $row1["weight"]!='0'){

$\_SESSION["pat"]["efficient\_data"]=1;

}

echo 1;

}

else

{

$message = "Invalid Username or Password!";

echo ($message);

}

}

else{

echo 404;

}

}

else{

echo 0;

}

?>

**COVID PREDICT**

# Flask utils

from flask import Flask, redirect, url\_for, request, render\_template

from werkzeug.utils import secure\_filename

from gevent.pywsgi import WSGIServer

# Import Keras dependencies

from tensorflow.keras.models import model\_from\_json

from tensorflow.python.framework import ops

ops.reset\_default\_graph()

from keras.preprocessing import image

import numpy as np

import h5py

from PIL import Image

import PIL

import os

# Initiate Flask app

app = Flask(\_\_name\_\_)

UPLOAD\_FOLDER = './uploads'

# Prep Keras model

MODEL\_ARCHITECTURE = './covid19\_model\_adv.json'

MODEL\_WEIGHTS = './covid19\_model\_weights.h5'

# Load the model from external files

json\_file = open(MODEL\_ARCHITECTURE, 'r')

loaded\_model\_json = json\_file.read()

json\_file.close()

model = model\_from\_json(loaded\_model\_json)

print ('Keras model loaded.')

# Get weights into the model

model.load\_weights(MODEL\_WEIGHTS)

print ('Keras model weights loaded.')

# take input image and make prediction

def predict(input\_image):

img = image.load\_img(input\_image, target\_size=(224,224))

x = image.img\_to\_array(img)

x = np.expand\_dims(x, axis=0)

prediction = model.predict\_classes(x)

return prediction

# Flask app routes

@app.route('/', methods=['GET'])

def index():

# Main Page

return render\_template('index.html')

@app.route('/predict', methods=['GET', 'POST'])

def upload\_predict():

if request.method == "POST":

# Save file from user upload

# image\_file = request.files["file"]

# if image\_file:

# image\_location = os.path.join(

# UPLOAD\_FOLDER,

# image\_file.filename

# )

# image\_file.save(image\_location)

# print(image\_file, image\_location)

# Get the file from post request

f = request.files['file']

# Save the file to ./uploads

basepath = os.path.dirname(\_\_file\_\_)

file\_path = os.path.join(basepath, 'uploads', secure\_filename(f.filename))

f.save(file\_path)

pred = predict(file\_path)

print(pred)

# Define the class type

classes = {'Diagnosis': ['Covid-19', 'Healthy']}

# Return the class type based on prediction

predicted\_class = classes['Diagnosis'][pred[0][0]]

print('Prediction: {}.'.format(predicted\_class))

return str(predicted\_class)

if \_\_name\_\_ == '\_\_main\_\_':

app.run(6321)

**PNEUMONIA DETECT**

from \_\_future\_\_ import division, print\_function

# coding=utf-8

import sys

import os

import glob

import re

import numpy as np

# Keras

from keras.applications.imagenet\_utils import preprocess\_input, decode\_predictions

from keras.models import load\_model

from keras.preprocessing import image

# Flask utils

from flask import Flask, redirect, url\_for, request, render\_template

from werkzeug.utils import secure\_filename

#from gevent.wsgi import WSGIServer

# Define a flask app

app = Flask(\_\_name\_\_)

# Model saved with Keras model.save()

MODEL\_PATH = 'models/trained\_model.h5'

#Load your trained model

model = load\_model(MODEL\_PATH)

#model.\_make\_predict\_function() # Necessary to make everything ready to run on the GPU ahead of time

print('Model loaded. Start serving...')

# You can also use pretrained model from Keras

# Check https://keras.io/applications/

#from keras.applications.resnet50 import ResNet50

#model = ResNet50(weights='imagenet')

#print('Model loaded. Check http://127.0.0.1:5000/')

def model\_predict(img\_path, model):

img = image.load\_img(img\_path, target\_size=(64, 64)) #target\_size must agree with what the trained model expects!!

# Preprocessing the image

img = image.img\_to\_array(img)

img = np.expand\_dims(img, axis=0)

preds = model.predict(img)

return preds

@app.route('/', methods=['GET'])

def index():

# Main page

return render\_template('index.html')

@app.route('/predict', methods=['GET', 'POST'])

def upload():

if request.method == 'POST':

# Get the file from post request

f = request.files['file']

# Save the file to ./uploads

basepath = os.path.dirname(\_\_file\_\_)

file\_path = os.path.join(

basepath, 'uploads', secure\_filename(f.filename))

f.save(file\_path)

# Make prediction

preds = model\_predict(file\_path, model)

os.remove(file\_path)#removes file from the server after prediction has been returned

# Arrange the correct return according to the model.

# In this model 1 is Pneumonia and 0 is Normal.

str1 = '86% Pneumonia'

str2 = 'Normal'

if preds == 1:

return str1

else:

return str2

return None

#this section is used by gunicorn to serve the app on Heroku

if \_\_name\_\_ == '\_\_main\_\_':

app.run(port=9176)

#uncomment this section to serve the app locally with gevent at: http://localhost:5000

# Serve the app with gevent

#http\_server = WSGIServer(('', 9176), app)

#http\_server.serve\_forever()

**CHAPTER 7**

**SYSTEM TESTING**

**CHAPTER 7**

**SYSTEM TESTING**

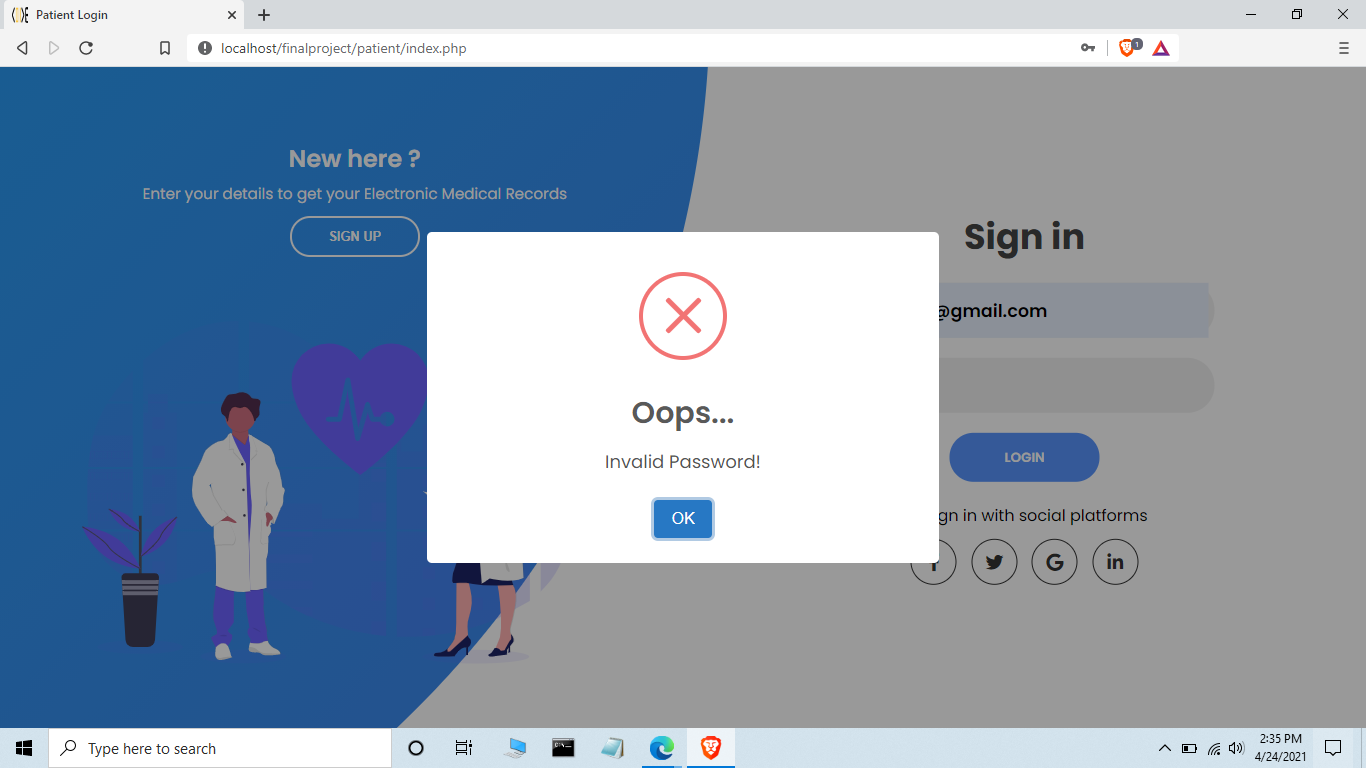
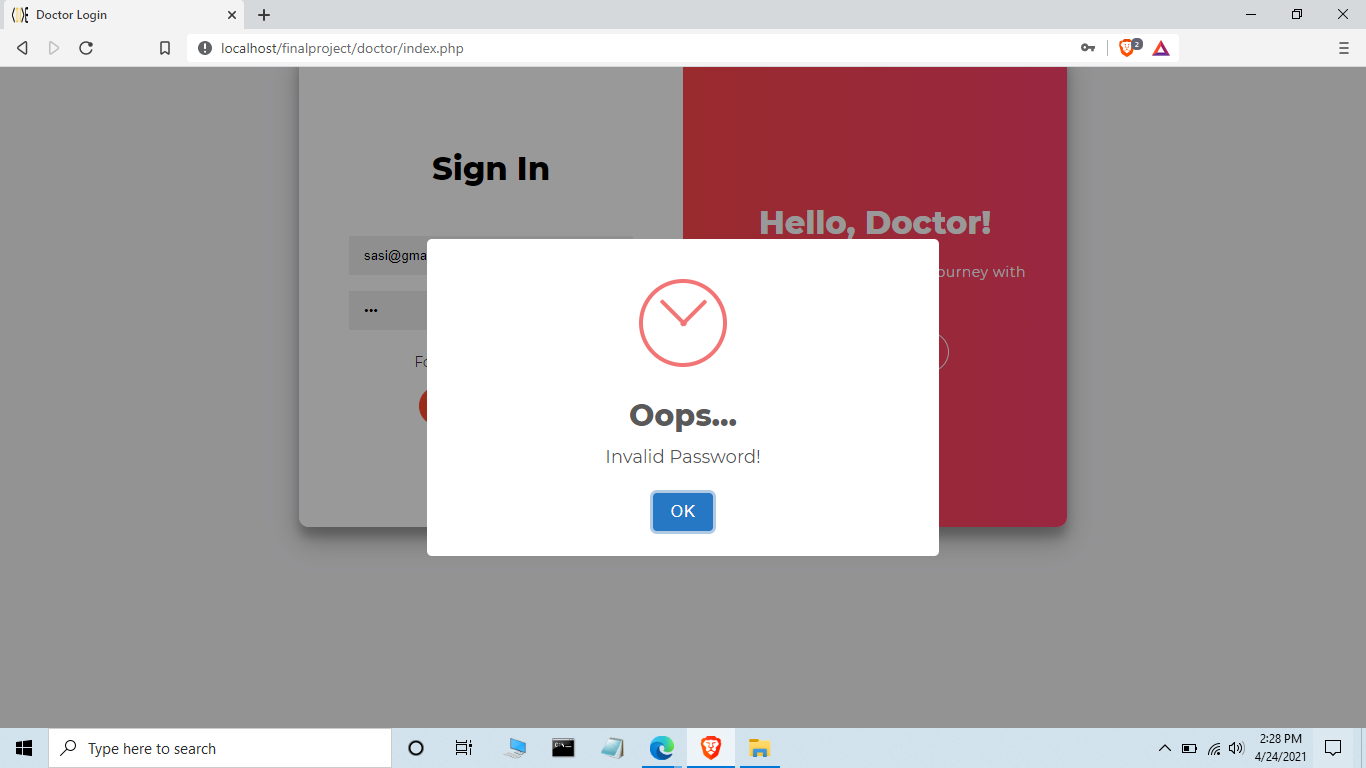
**7.1 UNIT TESTING**

Unit testingis a type of software testing where individual units or components of a software are tested. The purpose is to validate that each unit of the software code performs as expected. Unit Testing is done during the development (coding phase) of an application by the developers. Unit Tests isolate a section of code and verify its correctness. A unit may be an individual function, method, procedure, module, or object. In SDLC, STLC, V Model, Unit testing is first level of testing done before integration testing. Unit testing is a White Box testing technique that is usually performed by the developer. Though, in a practical world due to time crunch or reluctance of developers to tests, QA engineers also do unit testing.

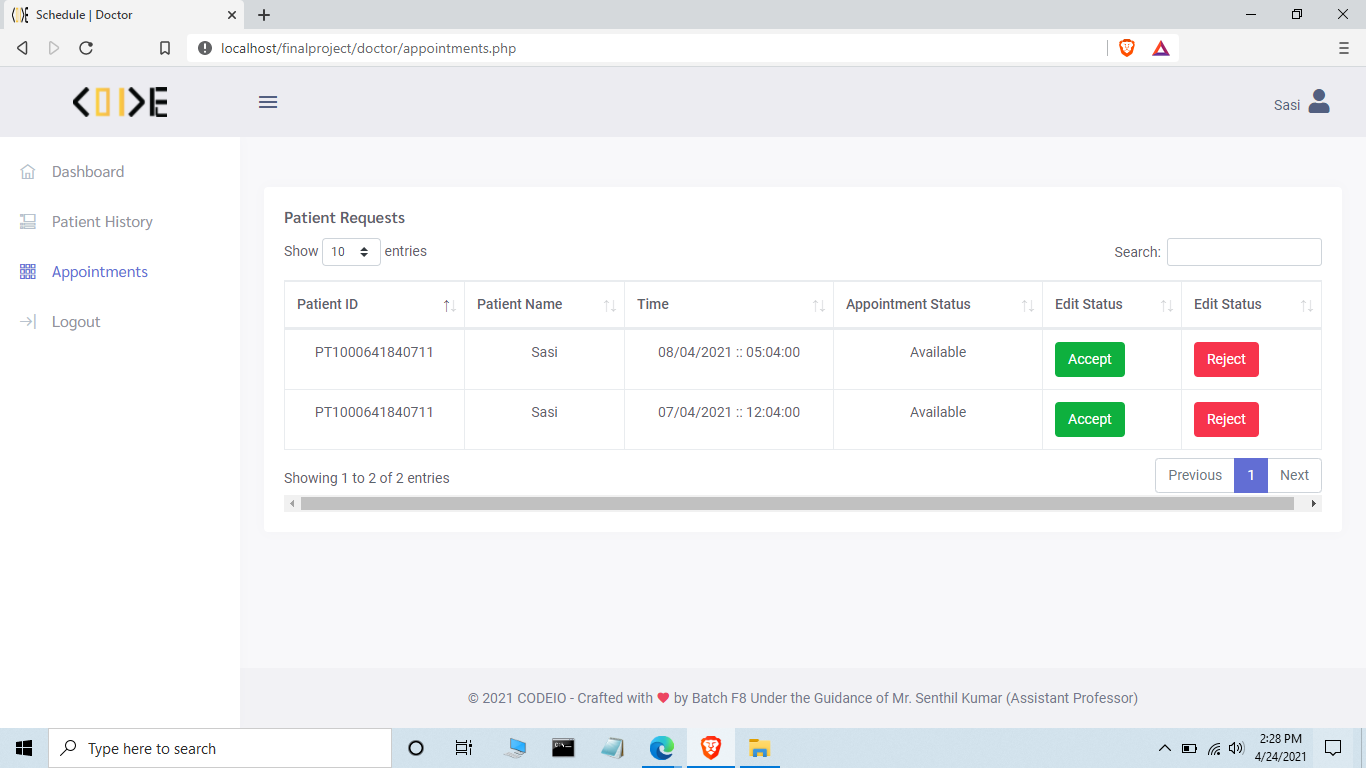
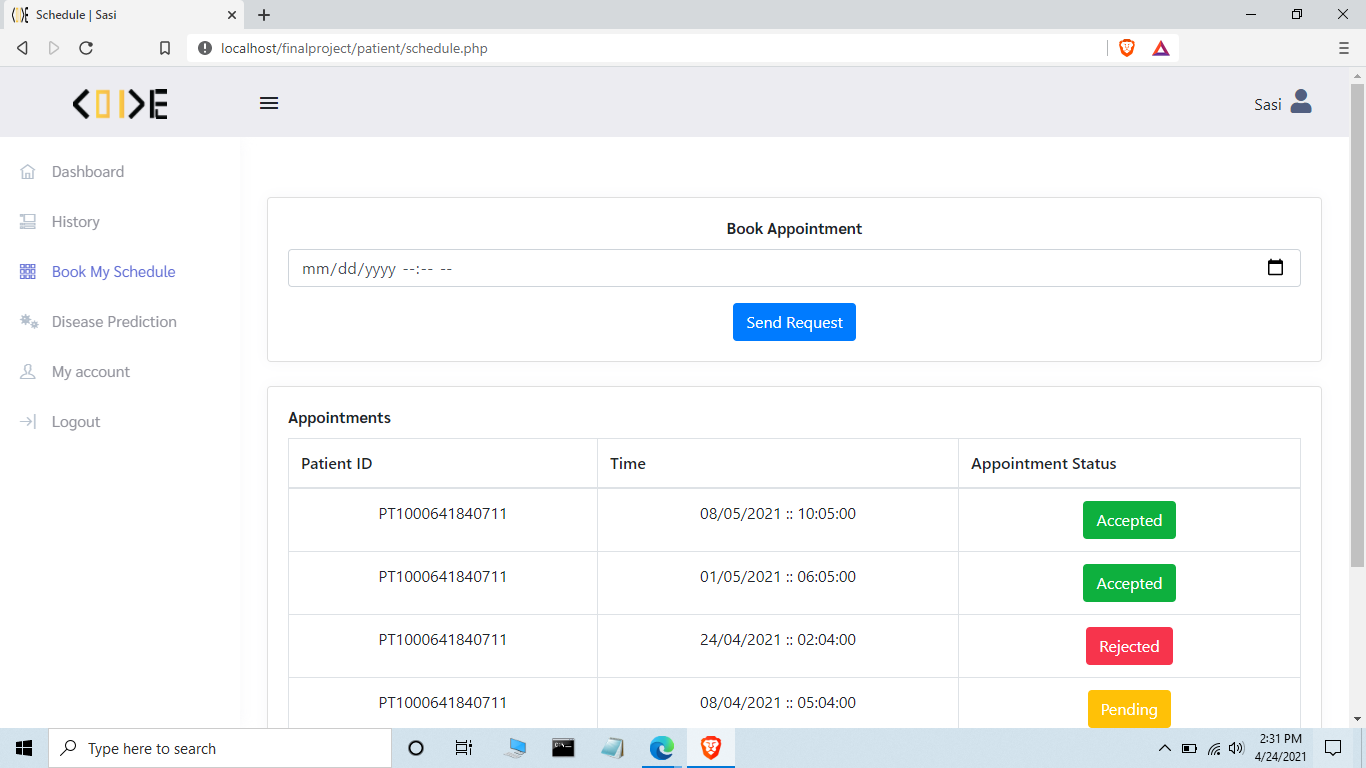
**7.2 INTEGRATION TESTING**

Integration testing is a systematic technique for construction the program structure while at the same time conducting tests to uncover errors associated with interfacing. i.e., integration testing is the complete testing of the set of modules which makes up the product. The objective is to take untested modules and build a program structure tester should identify critical modules. Critical modules should be tested as early as possible. One approach is to wait until all the units have passed testing, and then combine them and then tested. This approach is evolved from unstructured testing of small programs. Another strategy is to construct the product in increments of tested units. The major error that was faced during the project is linking error. When all the modules are combined the link is not set properly with all support files. Then we checked out for interconnection and the links. Errors are localized to the new module and its intercommunications. Testing is completed when the last module is integrated and tested.

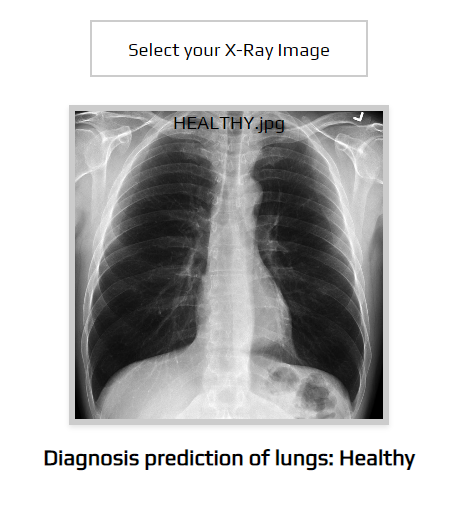
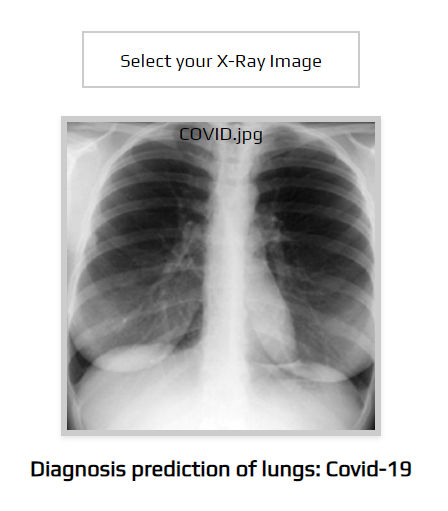
**7.3 TEST CASES & REPORTS / PERFORMANCE ANALYSIS**



**FIG 7.3.1 Checking Credentials**



**FIG 7.3.2 Booking appointment and confirmation**

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**Fig 7.3.3** **Output Screen Shots**

**CHAPTER 8**

**CONCLUSION**

**CHAPTER 8**

**CONCLUSION**

**8.1 CONCLUSION AND FUTURE ENHANCEMENTS**

**8.1.1 CONCLUSION**

This project focuses mainly on enhancing communication between the Patient and Doctor. It also helps in COVID prediction and PNEUMONIA prediction with chest X-ray scan and Electronic medical records system to manage the health records of the patient in the long term so the records such as prescription, reports can be stored in the digital format for easier access and it also enables the patient to book appointment with doctor and reminds them for check up at regular interval of time.

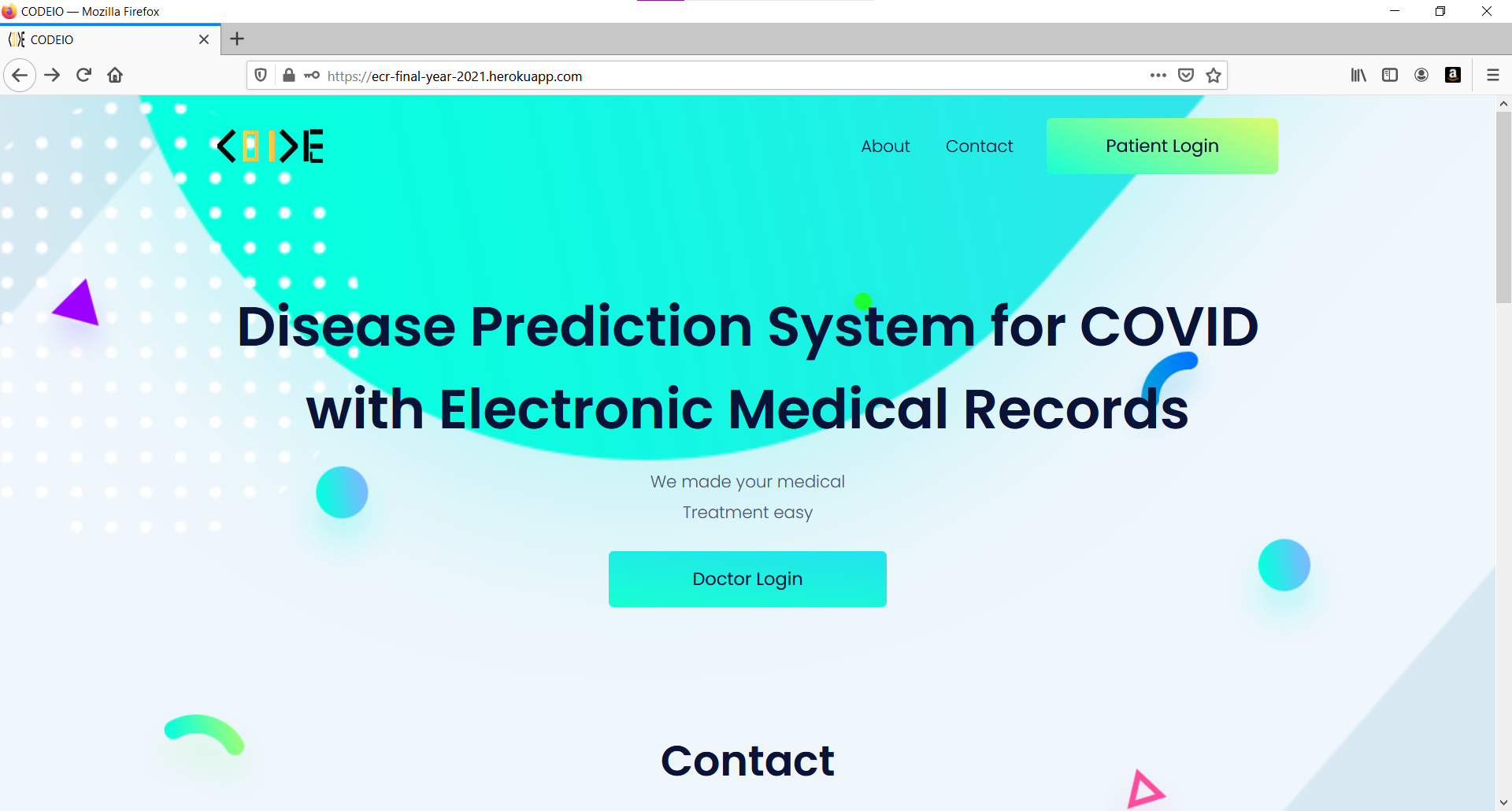
**FUTURE ENHANCEMENTS**

* Mobile application for easier access.
* Diabetes monitoring system.
* Realtime heart rate monitoring by connecting with wearables.

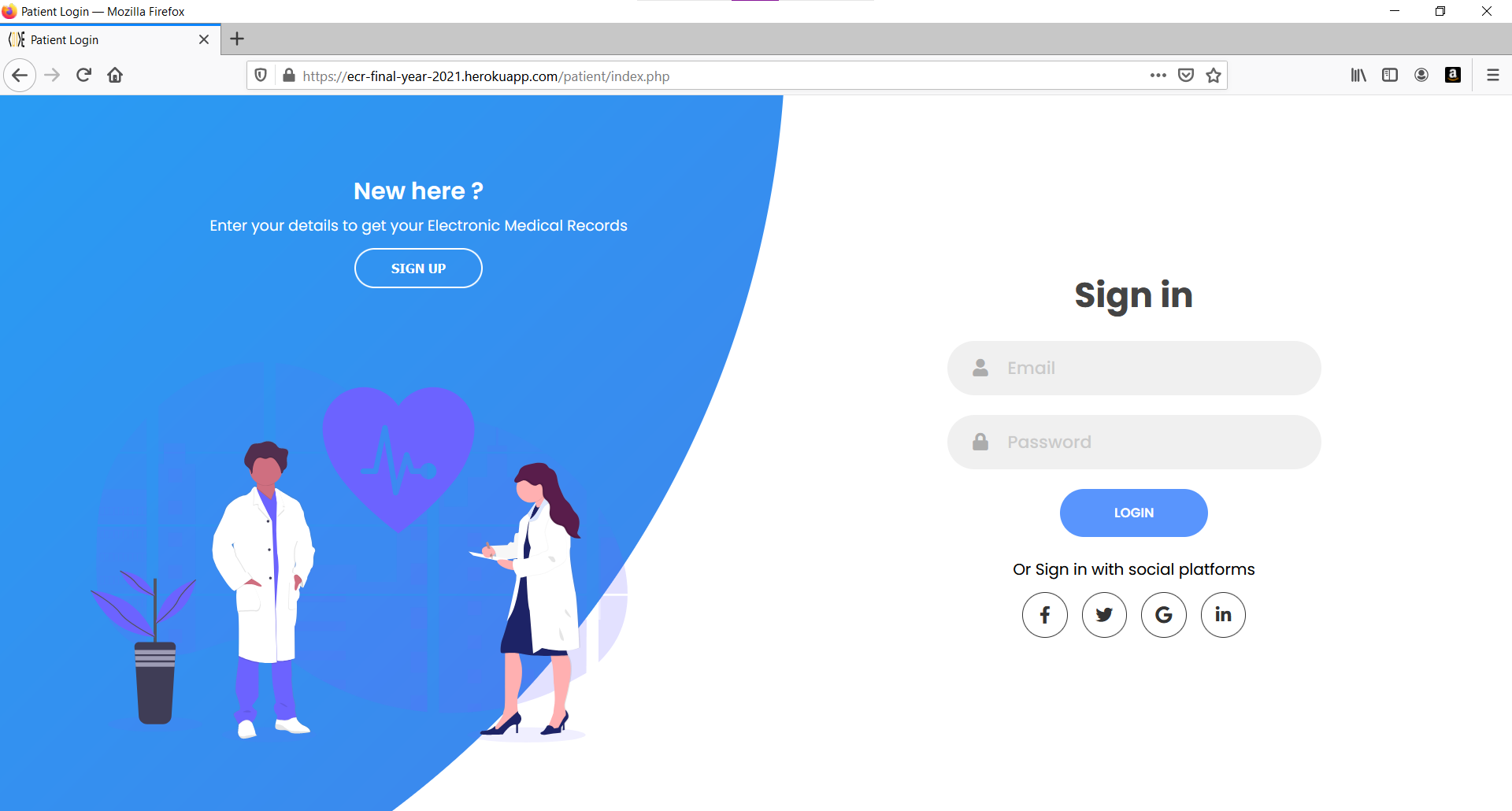
**APPENDICES**

**APPENDICES**

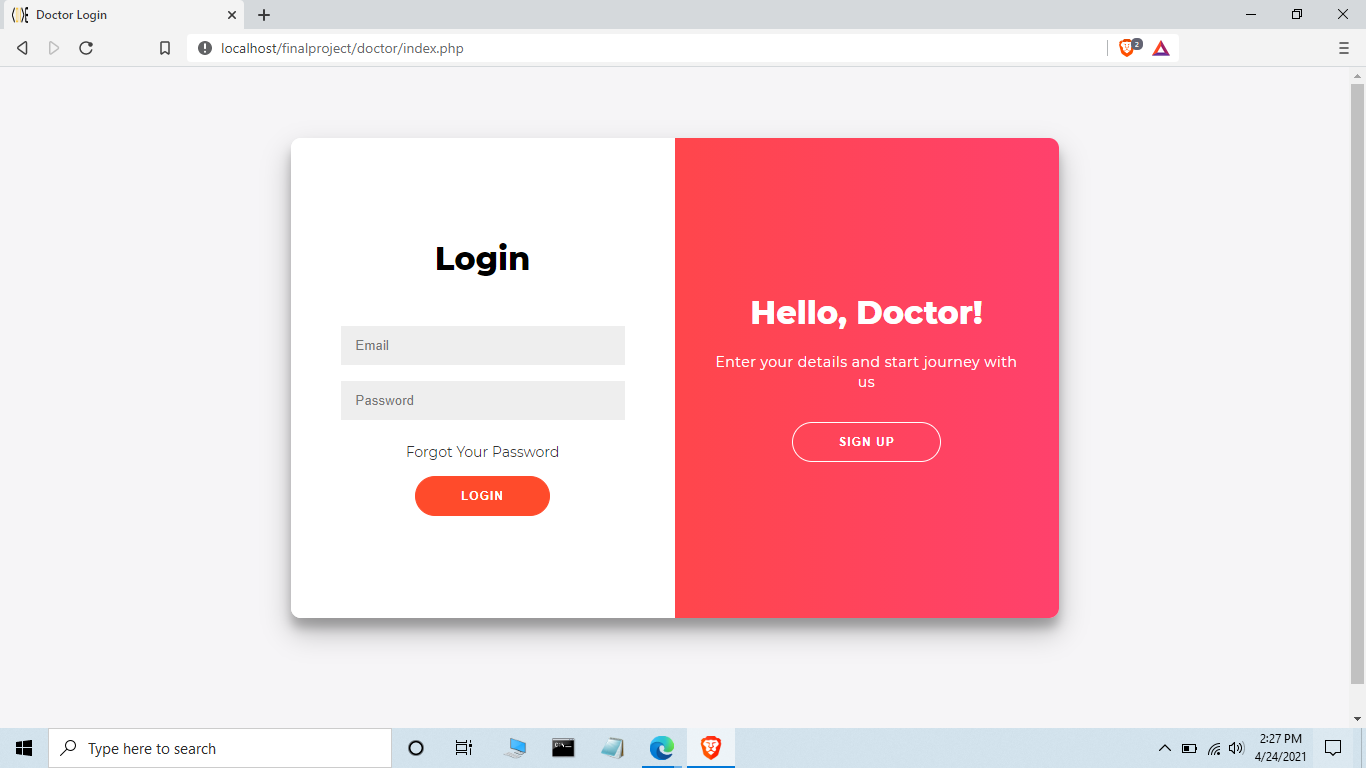
**A.1 SAMPLE SCREENS**

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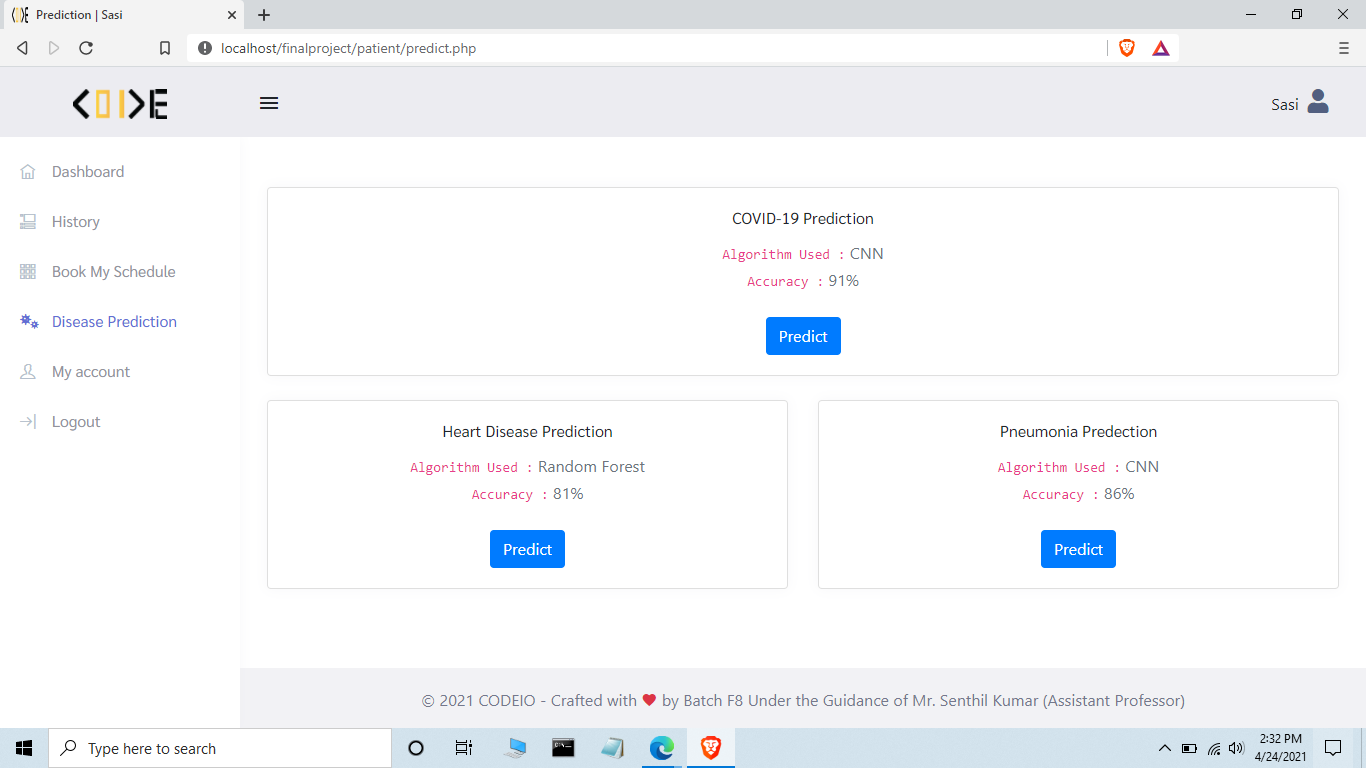
**Fig A.1.1. HOME PAGE**

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**FigA.1.2. PATIENT LOGIN**

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**Fig A.1.3. DOCTOR LOGIN**

****

**FIG A.1.4 PREDICTION SCREEN**

**REFERENCES**

**REFERENCES**

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