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CHAPTER 1

INTRODUCTION

1.1 Project Overview

According to the World Health Organization (WHO), cardiovascular diseases (CVDs) are the number one cause of death today. Over 17.7 million people died from CVDs in the year 2017 all over the world which is about 31% of all deaths, and over 75% of these deaths occur in low and middle-income countries. Arrhythmia is a representative type of CVD that refers to any irregular change from the normal heart rhythms. There are several types of arrhythmia including atrial fibrillation, premature contraction, ventricular fibrillation, and tachycardia. Although a single arrhythmia heartbeat may not have a serious impact on life, continuous arrhythmia beats can result in fatal circumstances. In this project, we build an effective electrocardiogram (ECG) arrhythmia classification method using a convolutional neural network (CNN), in which we classify ECG into seven categories, one being normal and the other six being different types of arrhythmia using deep two-dimensional CNN with grayscale ECG images. We are creating a web application where the user selects the image which is to be classified. The image is fed into the model that is trained and the cited class will be displayed on the webpage.

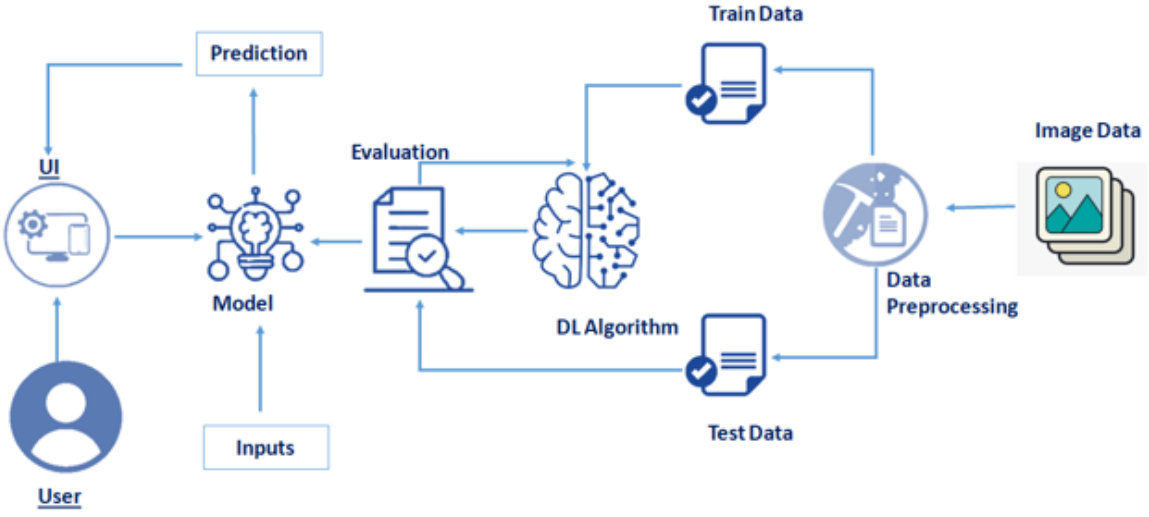

Fig 1.1

1.2 Purpose

In the past few decades, Deep Learning has provided to be a compiling tool because of its ability to handle large amounts of data. The interest to use hidden layers has surpassed traditional techniques, especially in pattern recognition. One of the most popular deep neural networks is Convolution al Neural Networks.

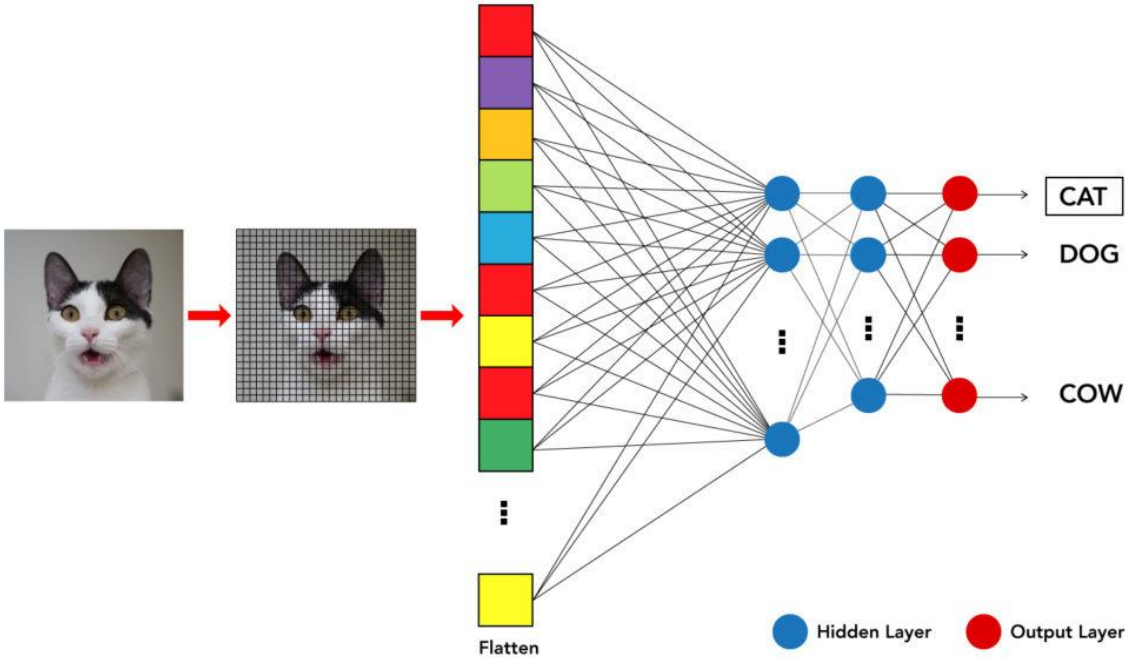

Fig 1.2

In deep learning, a convolution al neural network (CNN/ConvNet) is a class of deep neural networks, most commonly applied to analyse visual imagery. Now when we think of a neural network we think about matrix multiplications but that is not the case with ConvNet. It uses a special technique called Convolution. Now in mathematics convolution is a mathematical operation on two functions that produces a third function that expresses how the shape of one is modified by the other.

CHAPTER 2

LITERATURE SURVEY

2.1 Existing problem

Cardiac arrhythmia is a leading cause of cardiovascular disease, with a high fatality rate worldwide. The timely diagnosis of cardiac arrhythmias, determined by irregular and fast heart rate, may help lower the risk of strokes. Electrocardiogram signals have been widely used to identify arrhythmias due to their non-invasive approach. However, the manual process is error-prone and time-consuming. A better alternative is to utilise deep learning models for early automatic identification of cardiac arrhythmia, thereby enhancing diagnosis and treatment. In this article, a novel deep learning model, combining convolutional neural network and bi-directional long short-term memory, is proposed for arrhythmia classification. Specifically, the classification comprises five different classes: non-ectopic (N), supraventricular ectopic (S), ventricular ectopic (V), fusion (F), and unknown (Q) beats. The proposed model is trained, validated, and tested using MIT-BIH and St-Petersburg data sets separately. Also, the performance was measured in terms of precision, accuracy, recall, specificity, and f1-score. The results show that the proposed model achieves training, validation, and testing accuracies of 100%, 98%, and 98%, respectively with the MIT-BIH data set. Lower accuracies were shown for the St-Petersburg data set. The performance of the proposed model based on the MIT-BIH data set is also compared with the performance of existing models based on the MIT-BIH data set.

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2.3 Problem Statement Definition

Cardiovascular disease (CVD) is the leading cause of death globally. As per the World Health Organization (WHO), over 17.9 million humans around the world have died as a result of CVD diseases. Early diagnosis of CVD is critical to preventing sudden death from a heart attack or cardiac arrest. Cardiac arrhythmias refer to a group of disorders in which the heart's electrical impulse is abnormal, resulting in a quicker or slower beat than usual. A thorough investigation of the electrocardiogram (ECG) segment offers structural instruction about cardiac patients, widely employed in clinical procedures for arrhythmia identification. Usually, the ECG signs of cardiac disease do not appear within a short ECG recording period. They require a prolonged recording and monitoring of more than one day. This lengthens and complicates cardiologists' interpretation of ECG charts. Thus, numerous advancements in recent years have been made to ECG signals to decrease mortality and assist cardiologists in making timely, efficient, and accurate decisions. There are two processes for assessing ECG characteristics in the traditional manual method. The first stage involves extracting ECG features, while the second stage categorises ECG based on the retrieved characteristics. The process is cumbersome and error-prone for the cardiologists, and there is a need for automated ECG classification. Therefore, early recognition of cardiac arrhythmia is critical to effective investigation and treatment.

Several machine learning-based techniques for extracting heart characteristics and training models for arrhythmia identification have recently been developed. Linear predictive coding, wavelet entropy, synchro-squeezing wavelet transform, k-nearest neighbour and support vector machine models have all been utilised in predicting arrhythmia. While these non-deep learning techniques perform well, they suffer from various constraints, including poor classification performance for large data.

Thus, several deep learning methods have been applied recently to address a variety of difficult problems across all disciplines of health care research, including ECG classification. Deep learning methods transcend the limitations of traditional disease diagnosis, enhancing performance and generalisation by reducing pre-processing and feature extraction.

In this context, only a few studies on convolutional neural networks (CNNs), recurrent neural networks (RNNs) such as long short-term memory (LSTM), and bi-directional long short-term memory (Bi-LSTM) are used for heart categorization and found significant improvement. In recent years, end-to-end training of CNN has been the dominating technique for health care image analysis. Additionally, because of its capacity to record position and shift-invariant modes, CNN is used to analyse the morphology of clinical information. Even when the input signal is noisy, CNN may also be able to retrieve valuable data. These performance characteristics are mirrored in the network structure built layer by layer. As the network's layers increase, features are learned and expressed more abstractly and concisely.

Moreover, LSTM is a kind of artificial RNN, which is suitable for classifying sequences and time-series data. LSTM only preserves the previous data because the only inputs it has received are from the past. The Bi-LSTM is a variant of the traditional LSTM capable of learning from both past and future states. It enables the network to learn representations of the characteristics and the temporal connection between the features.

This work evaluates a deep learning model that combines CNN and Bi-LSTM on two data sets (MIT-BIH and St-Petersburg data sets) for autonomously detecting arrhythmia illness from ECG signals.

There are several types of arrhythmia including atrial fibrillation, premature contraction, ventricular fibrillation, and tachycardia. Although a single arrhythmia heartbeat may not have a serious impact on life, continuous arrhythmia beats can result in fatal circumstances

The contributions of this article are as follows:

- ➢ An overview of the state-of-the-art work related to categorizing multiple classes from ECG signals using different data sets.

- ➢ Proposed a novel deep learning model for categorizing five classes of cardiac arrhythmia from ECG signals using the MIT-BIH and ST-Petersburg data sets.
- ➢ Evaluate the optimum hyper-parameters of conv1D in terms of Kernel size, number of filters, activation function and number of layers.

- ➢ We combined the Bi-LSTM technique of size 32 based on factorial cross-entropy following the Adam optimizer with an evaluated optimum conv1D.

This approach is the first to detect cardiac arrhythmia in the way described above to the best of our knowledge. The results indicate that the detection accuracy, sensitivity, specificity, and precision are promising.

CHAPTER 3

IDEATION & PROPOSED SOLUTION

3.1 Empathy Map Canvas

An empathy map is a simple, easy-to-digest visual that captures knowledge about a user's behaviours and attitudes.

It is a useful tool to help teams better understand their users.Creating an effective solution requires understanding the true problem and the person who is experiencing it. The exercise of creating the map helps participants consider things from the user's perspective along with his or her goals and challenges.

Fig 3.1

3.2 Ideation & Brainstorming

Brainstorming provides a free and open environment that encourages everyone within a team to participate in the creative thinking process that leads to problem solving. Prioritizing volume over value, out-of-the-box ideas are welcome and built upon, and all participants are encouraged to collaborate, helping each other develop a rich amount of creative solutions.

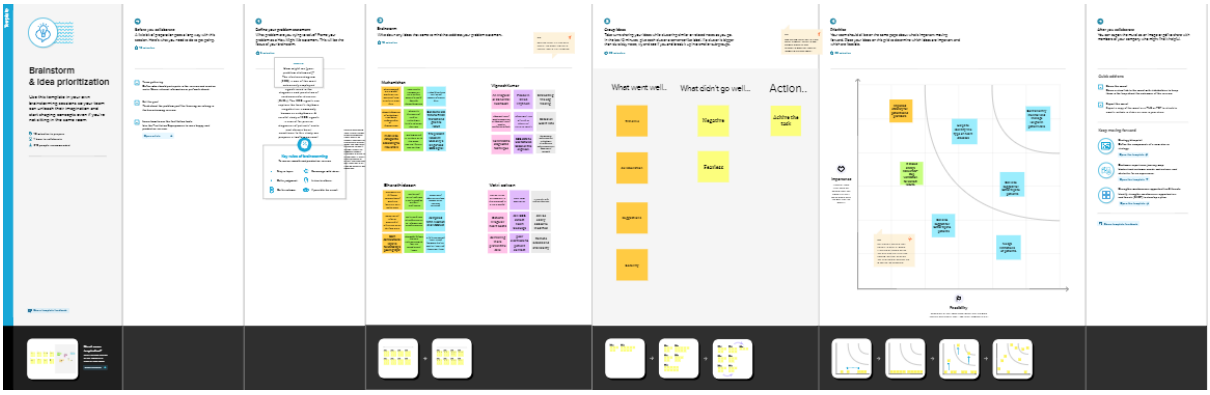


Fig 3.2

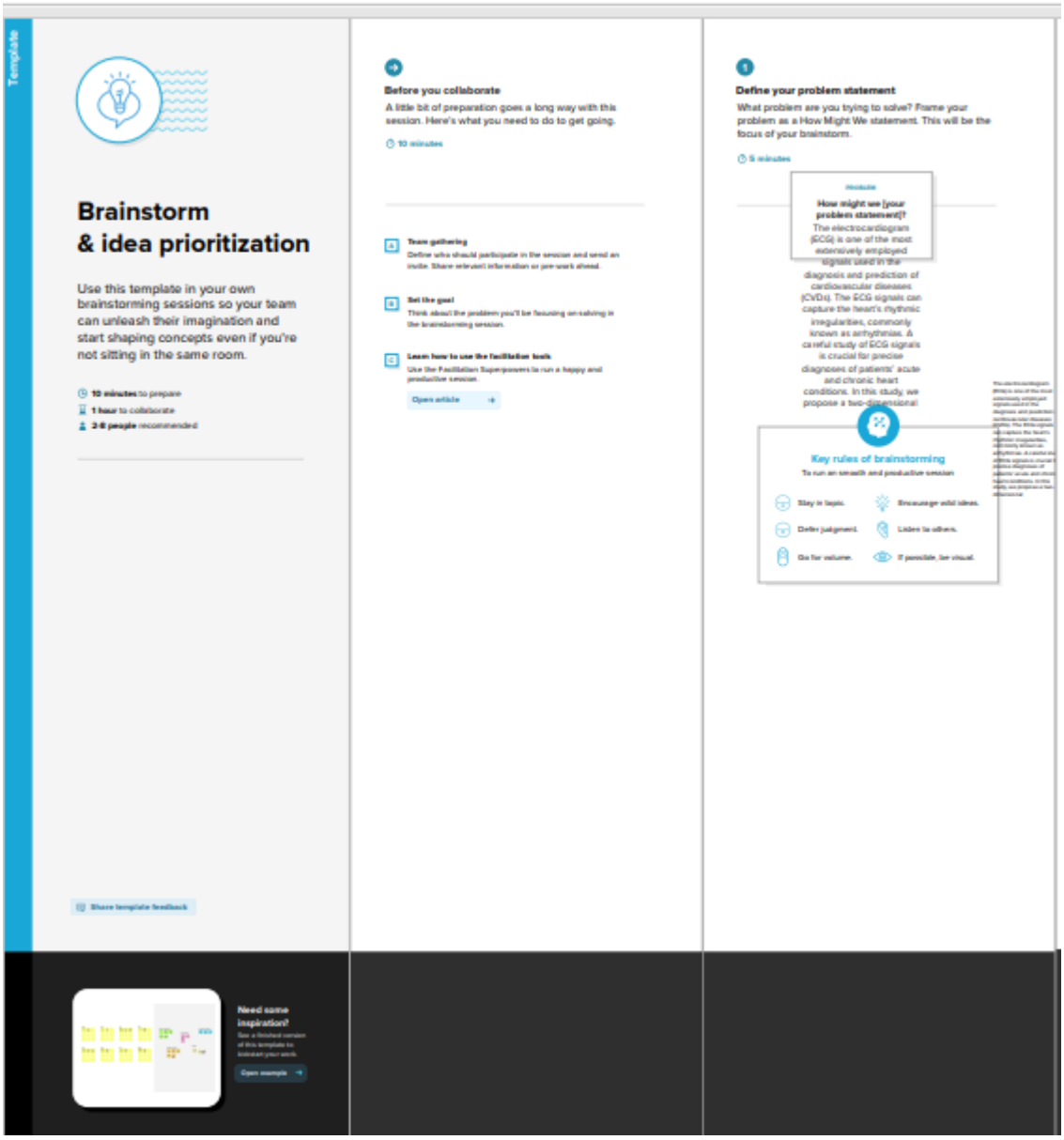

Template
Brainstorm
& idea prioritization
Use this template in your own brainstorming sessions so your team can unleash their imagination and start shaping concepts even if you're not sitting in the same room.
10 minutes to prepare
1 hour to collaborate
2-8 people recommended
Before you collaborate
A little bit of preparation goes a long way with this session. Here's what you need to do to get going.
10 minutes
Team gathering
Set the goal
Learn how to use the facilitation tools
Open article
Define your problem statement
What problem are you trying to solve? Frame your problem as a How Might We statement. This will be the focus of your brainstorm.
5 minutes
How might we [your problem statement]?
Key rules of brainstorming
To run an smooth and productive session
Stay in topic.
Encourage wild ideas.
Defer judgment.
Listen to others.
Go for volume.
If possible, be visual.
Need some inspiration?
Open example

Fig 3.3

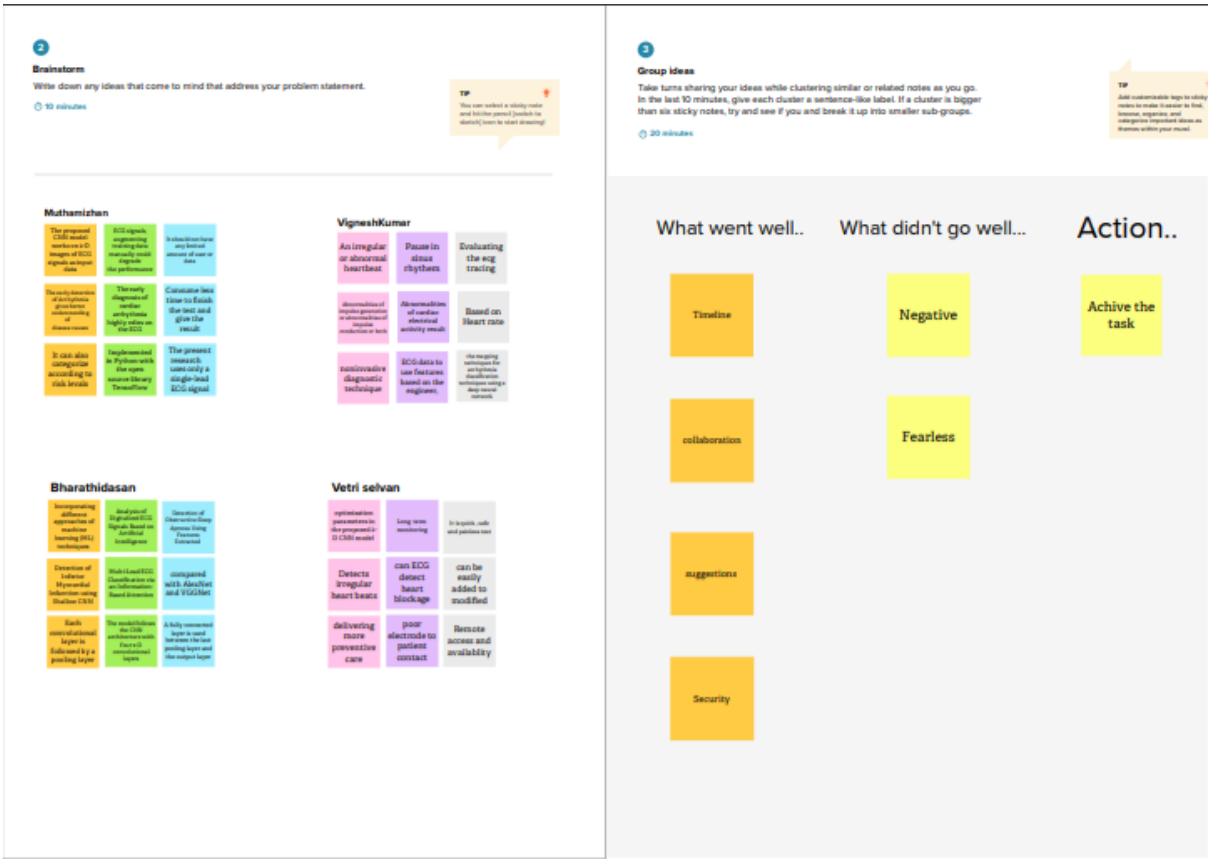

2
Brainstorm
Write down any ideas that come to mind that address your problem statement.
10 minutes
Muthamizhan
VigneshKumar
An irregular or abnormal heartbeat
Pause in sinus rhythem
Evaluating the ecg tracing
Based on Heart rate
Bharathidasan
Vetri selvan
Detects irregular heart beats
can ECG detect heart blockage
can be easily added to modified
Remote access and availablity
3
Group ideas
Take turns sharing your ideas while clustering similar or related notes as you go. In the last 10 minutes, give each cluster a sentence-like label. If a cluster is bigger than six sticky notes, try and see if you and break it up into smaller sub-groups.
20 minutes
What went well..
What didn't go well...
Action..
Timeline
Negative
Achive the task
collaboration
Fearless
suggestions
Security

Fig 3.3


4
Prioritize
Your team should all be on the same page about what's important moving forward. Place your ideas on this grid to determine which ideas are important and which are feasible.
20 minutes
Improved efficiency for patients and providers
Helps to identify the type of heart diseases
Conveniently monitor and manage longterm patient care
It should always have a two-step Verification for correct results.
Can also suggest for better tips to patients
Can also suggest for better tips to patients
No age limitations of patients
TIP
Importance
Feasibility

Fig 3.4

3.3 Proposed Solution

Project team shall fill the following information in the proposed solution template.

S.No	Parameter	Description
1.	Problem Statement (Problem to be solved)	Build an effective electrocardiogram (ECG) arrhythmia classification method using a convolutional neural network (CNN)
2.	Idea / Solution description	Classify ECG using deep two dimensional(2-D) CNN with grayscale ECG images
3.	Novelty / Uniqueness	When the image is fed into the model, the cited class will be displayed on the webpage
4.	Social Impact / Customer Satisfaction	Using this Method, We can get classification accurate
5.	Business Model (Revenue Model)	Creating a web application where the user selects the image which is to be classified
6.	Scalability of the Solution	It can classify into seven categories, one being normal and the other six being different types of arrhythmia

3.4 Problem Solution fit

Project Title: Classification of arrhythmia by using deep learning with 2-d ecg spectral image representation

Project Design Phase-I - Solution Fit Template

Team ID: PNT2022TMID48069

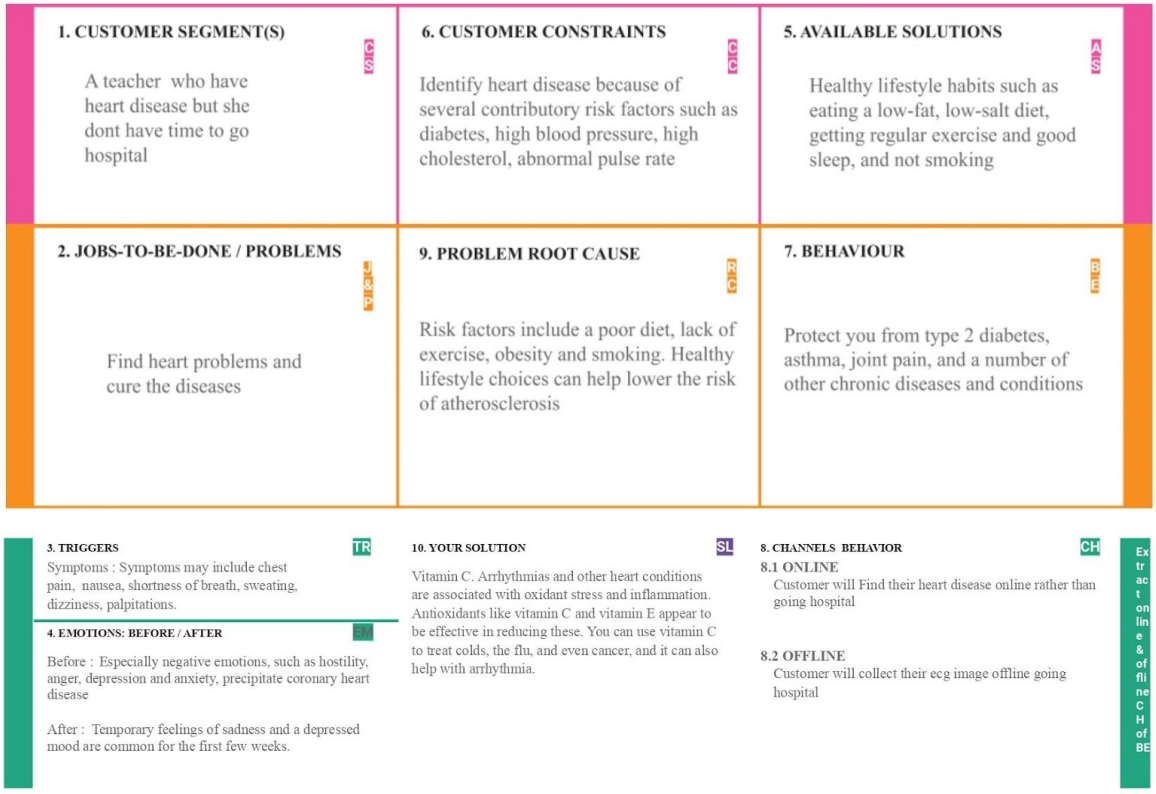


Fig 3.5

CHAPTER 4

REQUIREMENT ANALYSIS

4.1 Functional requirement

FR No.	Functional Requirement (Epic)	Sub Requirement (Story / Sub-Task)
FR-1	User Registration	Registration through Form Registration through Gmail Registration through LinkedIN
FR-2	User Confirmation	Confirmation via Email Confirmation via OTP
FR-3	User interface	Check your profile Choose your file Sign Out your account account and change your password
FR-4	Data processing	Evaluating the model using test data Training DL algorithm for a accuracy result Trained CNN model using Tensorflow,Kearas
FR-5	Predict ECG image	Use ECG images in our web application Collection of datasets Database read ECG images

4.2 Non-Functional requirements

NFR No.	Non-Functional Requirement	Description
NFR-1	Usability	Wireless ECG body sensor Savvy is a feasible solution for reliable and accurate long-term heart rhythm monitoring. However, there were no studies dealing with usability of this sensor in field testing.
NFR-2	Security	The work presented in this paper is applicable for encrypting and decrypting personalised Electrocardiograph ECG signals for secure transmission.
NFR-3	Reliability	The extent to the consistently performs the specified functions without failure
NFR-4	Performance	It essentially specifies how the system should behave and that it constrains the ECG wavelength of accurate disease information gathering.
NFR-5	Availability	Availability describes how likely the system is accessible to a user at a given point in time and periodically for a solution.
NFR-6	Scalability	Scalability The ability of the user problem in arrhythmia disease to handle an increase in workload without performance degradation, or its ability to quickly enlarge.

CHAPTER 5

PROJECT DESIGN

5.1 Data Flow Diagrams

A Data Flow Diagram (DFD) is a traditional visual representation of the information flows within a system. A neat and clear DFD can depict the right amount of the system requirement graphically. It shows how data enters and leaves the system, what changes the information, and where data is stored.

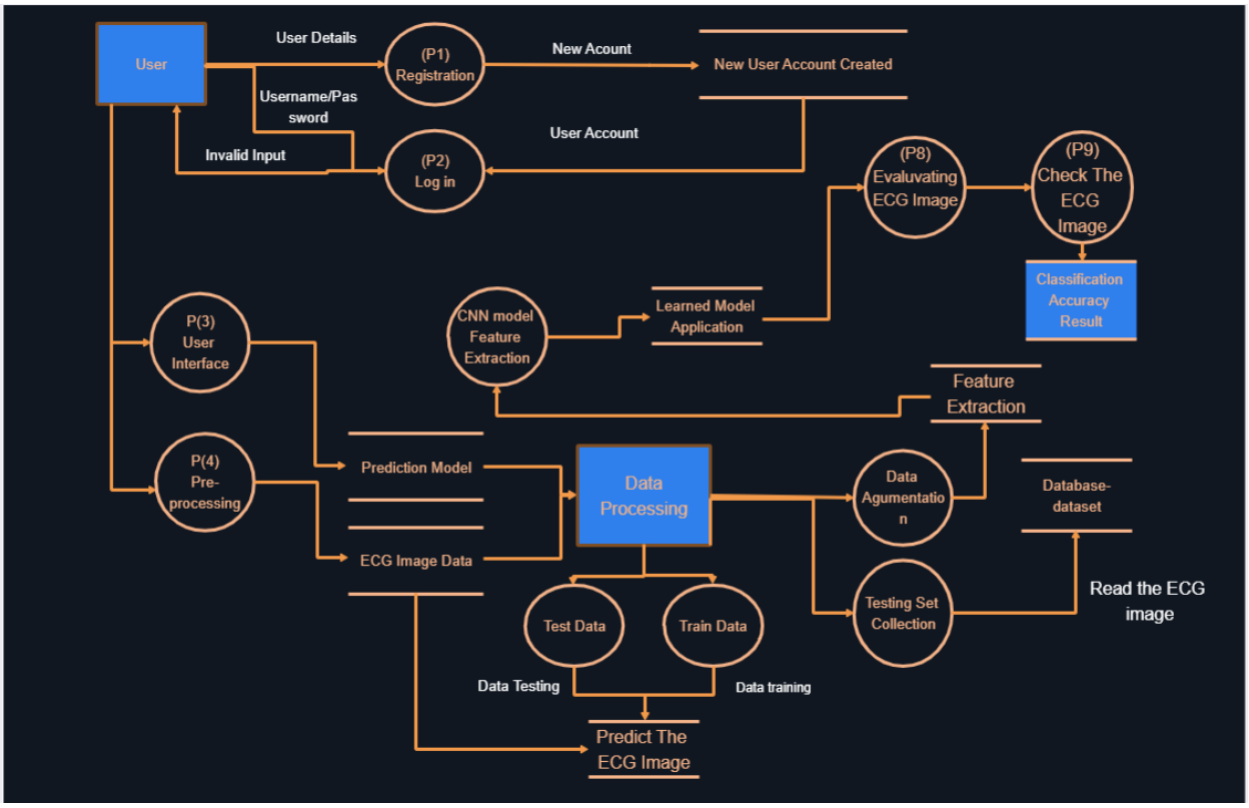


Fig 5.1 Data Flow Diagram

5.2 Solution & Technical Architecture

5.2.1 Solution Architecture

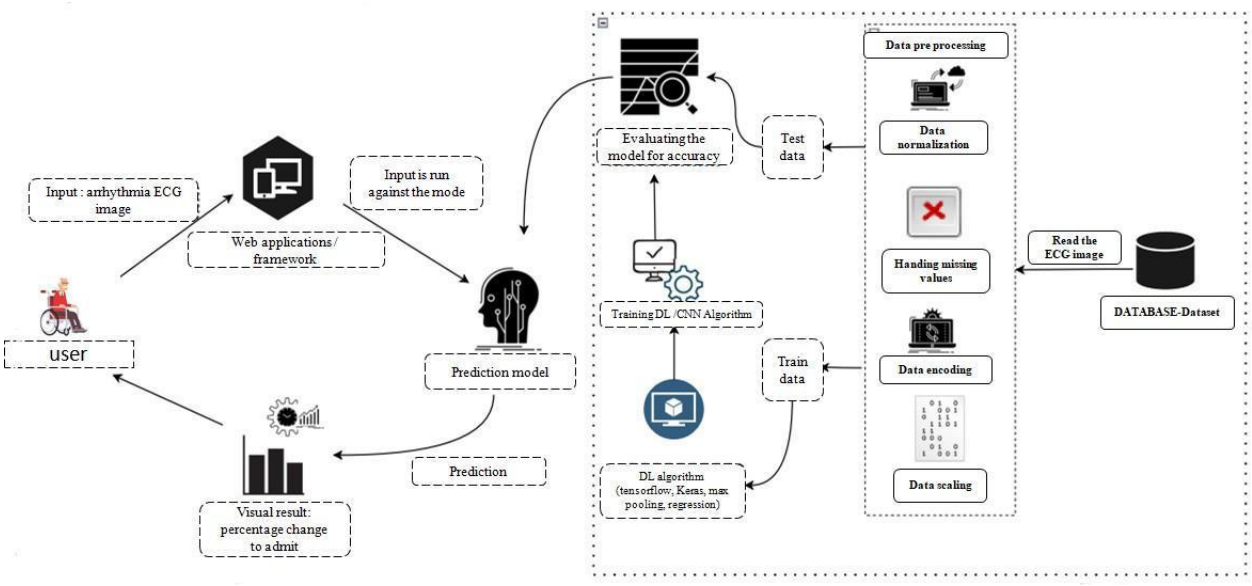


Fig 5.2 Minimum Viable Architecture for MVP

5.2.1.1 Technologies needed for Minimum Viable Product deployment

- ➢ Working with HTML & CSS Using Frontend
- ➢ Working with image processing technique
- ➢ Working with Tensorflow capabilities
- ➢ Working with Keras capabilities
- ➢ Working Trained CNN model
- ➢ Build a web application using the Flask framework

5.2.1.2 Platform

- ➢ Git & GitHub - Project Management
- ➢ IBM Cloud - Hosting
- ➢ IBM Watson - Training the Deep Learning Mode

5.2.2 Technical Architecture

The Deliverable shall include the architectural diagram as below and the information

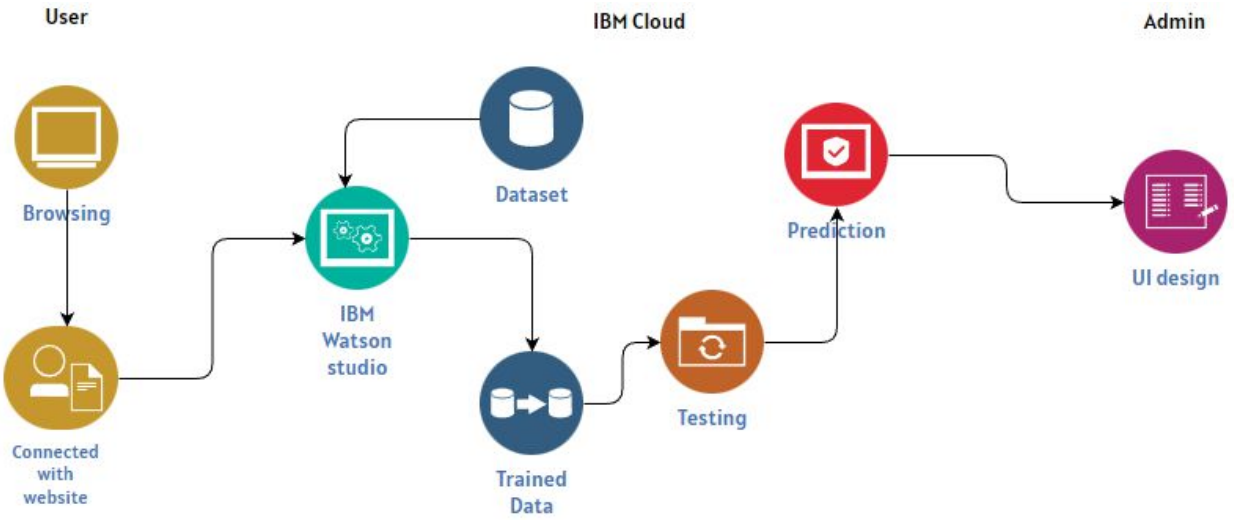


Fig 5.2 Technical Architecture

5.2.1 Components & Technologies:

S.No	Component	Description	Technology
1.	User Interface	Web UI, Mobile UI.	HTML, CSS, JavaScript / React
2.	Application Logic-1	Python is used for backend	Python
3.	Application Logic-2	It's a symbolic math toolkit that performs a variety of tasks including deep neural network training and inference using dataflow and differentiable programming	Tensorflow
4.	Cloud Database	A global technology company that provides hardware, software, cloud-based services and cognitive computing.	IBM Cloud
5.	Cloud Database	Breaks up data into blocks and then stores those blocks as separate pieces, each with a unique identifier.	IBM Block
6.	External API-1	Purpose of External API used in the application	IBM Weather API, etc.
7.	External API-2	Purpose of External API used in the application	Aadhar API, etc.
8.	Machine Learning Model	Object recognition is a subfield of computer vision, artificial intelligence, and machine learning	Object Recognition Model
9.	Deep learning Model	The images from the created dataset are fed into a neural network algorithm.	Image Recognition Model

3.3 User Stories

User Type	User Story Number	User Story / Task	Priority	Release
Customer	USN-1	Registration	High	Sprint-1
	USN-2	Confirmation	High	Sprint-1
	USN-3	Login	Low	Sprint-2
	USN-4	Dashboard	High	Sprint-1
Administrator	USN-5	Login	Low	Sprint-2
	USN-6	Dashboard	High	Sprint-1

CHAPTER 6

PROJECT PLANNING & SCHEDULING

6.1 Sprint Planning & Estimation

Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority Team	Members
Sprint-1	Download The Dataset	USN-1	We can download the Dataset contains Six classes	1	Low	Bharathidasan.R Muthamizhan.A
Sprint-1	Import The ImageDataGenerator Library	USN-2	We can import ImageDataGenerator	1	Low	Bharathidasan.R Muthamizhan.A
Sprint-1	Configure ImageDataGenerator class	USN-3	We can configure the ImageDataGenerator class	1	Low	VigneshKumar.R Vetriselvan.PL Muthamizhan.A
Sprint-2	Apply the ImageDataGenerator functionality to Trainset and Dataset	USN-4	We can apply ImageDataGenerator to train dataset	2	Medium	Vetriselvan.PL Bharathidasan.R Muthamizhan.A
Sprint-1	Import Libraries	USN-5	We can import required Libraries	1	Low	Muthamizhan.A
Sprint-1	Initialize the Model	USN-6	Initializing the Image recognition model	2	Medium	VigneshKumar.R Bharathidasan.R
Sprint-4	Adding CNN layer	USN-7	We can add Convolutional Neural Network(CNN) used for image/object recognition and classification	4	High	VigneshKumar.R Muthamizhan.A
Sprint-4	Adding Dense Layer	USN-8	We can add Dense Layer in which each neuron receives input from all the neurons of previous layer	4	High	VigneshKumar.R Vetriselvan.PL Muthamizhan.A

Sprint-4	Configure The Learning Process	USN-9	We can configure The Learning process which is a method, mathematical logic or algorithm that improves the network's performance and/or training time.	4	High	Vignesh Kumar.R Vetriselvan.PL Bharathidasan.R Muthamizhan.A
Sprint-3	Train the Model	USN-10	We can train our model with our image dataset. fit_generator functions used to train a deep learning neural network	3	High	Vignesh Kumar.R Muthamizhan.A
Sprint-1	Save the Model	USN-11	We can save The model with .h5 extension	2	Medium	Bharathidasan.R Muthamizhan.A
Sprint-2	Test the model	USN-12	We can Test the model Through loaded necessary libraries, saved model.	2	Medium	Vignesh Kumar.R Bharathidasan.R
Sprint-3	Create Html files	USN-13	We use HTML to create the front end part of the web page.	3	High	Vignesh Kumar.R Vetriselvan.PL
Sprint-4	Build Python code	USN-14	We build the flask file 'app.py' which is a web framework written in python for server-side scripting.	4	High	Bharathidasan.R Muthamizhan.A
Sprint-1	Run the App	USN-15	We can run the App	2	Medium	Vignesh Kumar.R Muthamizhan.A
Sprint-2	Register IBM Cloud	USN-16	We can register IBM Cloud	2	Medium	Vignesh Kumar.R Muthamizhan.A
Sprint-3	Train the model on IBM	USN-17	We can Train Out model on IBM	3	High	Vignesh Kumar.R Muthamizhan.A

6.2 Sprint Delivery Schedule

Sprint	Total Story Points	Duration	Sprint Start Date	Sprint End Date (Planned)	Story Points Completed (as on Planned End Date)	Sprint Release Date (Actual)
Sprint-1	20	5 Days	24 Oct 2022	28 Oct 2022	20	28 Oct 2022
Sprint-2	20	5 Days	30 Oct 2022	04 Nov 2022	20	04 Nov 2022
Sprint-3	20	5 Days	06 Nov 2022	11 Nov 2022	20	11 Nov 2022
Sprint-4	20	5 Days	13 Nov 2022	18 Nov 2022	20	18 Nov 2022

6.3 Reports from JIRA

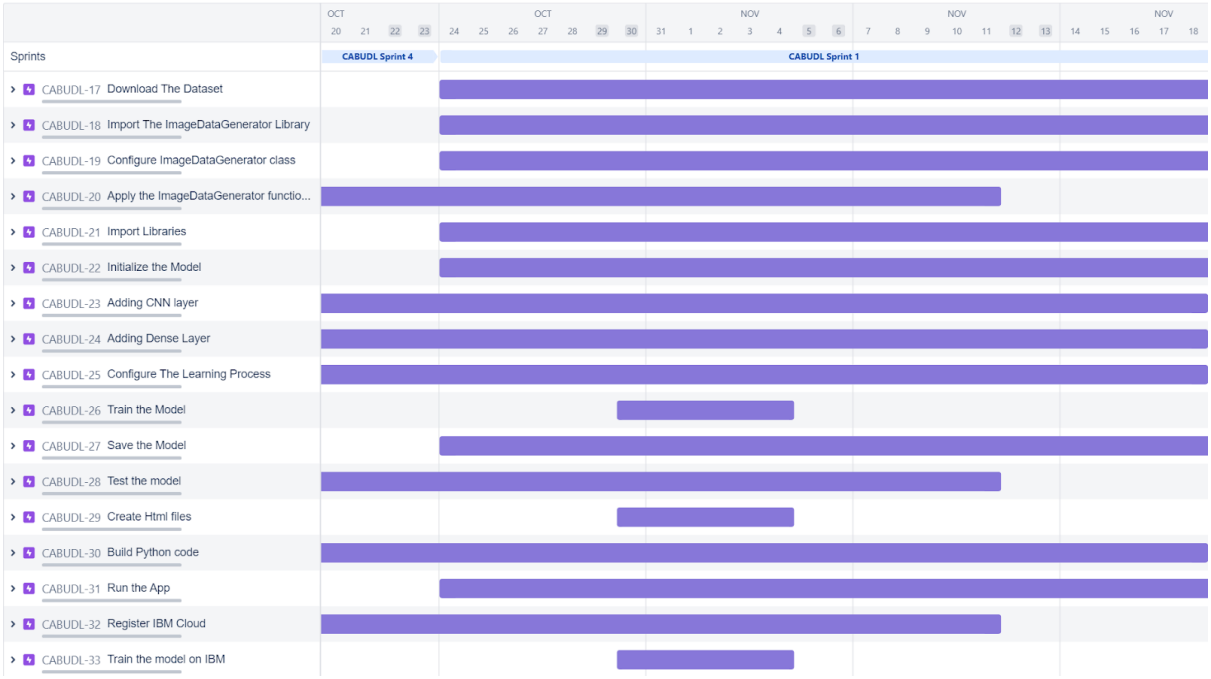


Fig 6.1

CHAPTER 7

CODING & SOLUTIONING

7.1 Feature 1 (UI Designing)

User interface (UI) elements are the parts we use to build apps or websites. They add interactivity to a user interface, providing touchpoints for the user.

Coding (Front end)

index.html

```
<!DOCTYPE html>

<html lang="en">



<head>

  <meta charset="UTF-8" />

  <meta http-equiv="X-UA-Compatible" content="IE=edge" />

  <meta name="viewport" content="width=device-width, initial-scale=1.0" />

  <title>Life Care - Heart Prediction Online</title>

  <link rel="shortcut icon" href="{{url_for('static',
filename='images/fevicon.png' )}}" type="image/x-icon">

  <link rel="stylesheet"
href="https://cdnjs.cloudflare.com/ajax/libs/aos/2.3.1/aos.css" />

  <link
href="https://fonts.googleapis.com/css2?family=Playfair+Display:wght@600&d
isplay=swap" rel="stylesheet" />

  <link rel="stylesheet" href="{{url_for('static',
filename='css/style.css' )}}" />

  <script src="https://kit.fontawesome.com/64d58efce2.js"
crossorigin="anonymous">
```

```
  </script>
</head>


<body>
  <div class="wrapper">
    <!--Navigation Bar-->
    <div class="nav">
      <div class="logo">
        <a href="/">
          <img src="static\images\logo.png" style="width:190px" />
        </a>
      </div>
      <div class="links">
        <a href="/home" class="mainLink">Home</a>
        <a href="/info">Info</a>
        <a href="/about">About Us</a>
        <a href="/contact">Contact Us</a>
        <a href="/upload" class="btn1">Predict</a>
      </div>
    </div>
    <!--Landing Page-->
    <div class="landing">
      <div class="landingText" data-aos="fade-up"
data-aous-duration="1000">
        <h1>
```

```
          Classification of Arrhythmia
          <span style="color: #e0501b; font-size: 4vw">Prediction</span>
        </h1>
        <h3>
          According to the World Health Organization (WHO), cardiovascular
diseases (CVDs) are the number one cause of
          death today. Over 17.7 million people died from CVDs in the
          year 2017 all over the world which...
        </h3>

        <div class="btn2"><a href="/info">Read more</a>
        </div>
      </div>
      <div class="landingImage" data-aos="fade-down"
data-aous-duration="2000">
        <img src="static/images/banner_img.jpg" alt="bannerImg"
style="width: 500px; height:360px" />
      </div>
    </div>

    <!--Service Section-->
    <div class="about">
      <div class="aboutText" data-aos="fade-up" data-aous-duration="1000">
        <h1 style="margin: 20px;">
          Our Patients Are at Centre
```

```
          <span style="color: #2f8be0; font-size: 3vw">of Every We
Do</span>
        </h1>
        <div class="image-container">
          <img src="/static/images/connsultPationt.png"
alt="consultPationt"
            style="width:400px; margin:100px 0px 0px 90px;"></img>
        </div>
      </div>
      <div class="aboutList" data-aos="fade-left"
data-aous-duration="1000">
        <ol>
          <li>
            <span>01</span>
            <p>99.8% accurate result.</p>
          </li>
          <li>
            <span>02</span>
            <p>No need to go hospital.</p>
          </li>
          <li>
            <span>03</span>
            <p>No need to login</p>
          </li>
          <li>
            <span>04</span>
```

```
            <p>24/7 Support.</p>
          </li>
        </ol>
      </div>
    </div>


    <!--Info Section-->
    <div class="infoSection">
      <div class="infoHeader" data-aos="fade-up"
data-aous-duration="1000">
        <h1>
          We Analyse Youe Health states <br /><span style="color:
#e0501b">In Order to Top Service.</span>
        </h1>
      </div>
      <div class="infoCards">
        <div class="card one" data-aos="fade-up"
data-aous-duration="1000">
          <img src="static/images/banner_1.svg" class="cardoneImg" alt=""
data-aos="fade-up"
            data-aous-duration="1100" />
          <div class="cardbgone"></div>
          <div class="cardContent">
            <h2>Health State</h2>
            <p>
              Easy to know Health state
```

```
            </p>
            <a href="/">
              <div class="cardBtn">
                <img src="static/images/next.png" alt="" class="cardIcon"
/>
              </div>
            </a>
          </div>
        </div>
        <div class="card two" data-aos="fade-up"
data-aous-duration="1300">
          <img src="static/images/banner_1.svg" class="cardtwoImg" alt=""
data-aos="fade-up"
            data-aous-duration="1200" />
          <div class="cardbgtwo"></div>
          <div class="cardContent">
            <h2>User Friendly</h2>
            <p>
              Easy for people to use, prediction
            </p>
            <a href="/">
              <div class="cardBtn">
                <img src="static/images/next.png" alt="" class="cardIcon"
/>
              </div>
            </a>
```

```
          </div>
        </div>
        <div class="card three" data-aos="fade-up"
data-aous-duration="1600">
          <img src="static/images/banner_1.svg" class="cardthreeImg"
alt="" data-aos="fade-up"
            data-aous-duration="1000" />
          <div class="cardbgthree"></div>
          <div class="cardContent">
            <h2>Classification of Arrhythmia</h2>
            <p>
              Prediction Classification of Arrhythmia
            </p>
            <a href="/upload">
              <div class="cardBtn">
                <img src="static/images/next.png" alt="" class="cardIcon"
/>
              </div>
            </a>
          </div>
        </div>
      </div>
    </div>

    <!--Banner And Footer-->
    <div class="banner">
```

```
      <div class="bannerText" data-aos="fade-right"
data-aous-duration="1000">

        <h1>

          Download the LifeCare App Today <br /><span style="font-size:
1.6vw; font-weight: normal"

            class="bannerInnerText">Stay Updated and get all your medical
needs taken care of!</span>

        </h1>

        <a href="/"><img src="static/images/AndroidPNG.png" alt="" /></a>

        <a href="/"><img src="static/images/iosPNG.png" alt="" /></a>

      </div>

      <div class="bannerImg" data-aos="fade-up" data-aous-duration="1000">

        <img src="static/images/app.png" alt="" />

      </div>

    </div>


    <div class="footer">

      <h1>LifeCare</h1>

      <div class="footerlinks">

        <a href="/home" class="mainLink">Home</a>

        <a href="/info">Info</a>

        <a href="/about">About Us</a>

        <a href="/contact">Contact Us</a>

      </div>

    </div>

  </div>
```

```
  <script
src="https://cdnjs.cloudflare.com/ajax/libs/aos/2.3.1/aos.js"></script>
  <script>
    AOS.init();
  </script>
</body>


</html>
```

style.css

```
body::-webkit-scrollbar {
  display: none;
}
body,
html {
  background-color: #fff;
  font-family: "Playfair Display", serif;
  overflow-x: hidden !important;
  margin: 0px !important;
  padding: 0px !important;
}
* {
  text-decoration: none !important;
}
/* Navigation Bar */
```

```css
.nav {
  position: fixed;
  z-index: 1000;
  top: 0;
  right: 0;
  left: 0;
  height: 80px;
  display: flex;
  flex-direction: row;
  justify-content: space-between;
  align-items: center;
  padding: 0 25px 0 25px;
  background-color: #fff;
  box-shadow: 0 19px 38px rgba(0, 0, 0, 0.1);
  border-bottom-left-radius: 10px;
  border-bottom-right-radius: 10px;
}
.nav .links a {
  margin-right: 25px;
  font-size: 16px;
  font-weight: 600;
  color: #000;
}
.nav .links .mainLink {
  color: #e8501b;
```

```
}


.nav .links a:hover {
  color: #007bff;
}
.nav .links .btn1 {
  padding: 8px 34px;
  margin-left: 10px 0px 10px 0px;
  display: inline-block;
  padding: 10.5px 36px;
  font-size: 14px;
  color: #000;
  -o-transition: all 0.4s ease-in-out;
  -webkit-transition: all 0.4s ease-in-out;
  transition: all 0.4s ease-in-out;
  text-transform: capitalize;
  border: 1px solid #e4e6ea;
  font-family: "Playfair Display", serif;
}


.nav .links .btn1:hover {
  color: #fff;
  border-radius: 45px;
  background-color: #007bff;
}
```

```css
.nav .user-pic {
  width: 40px;
  border-radius: 50%;
  cursor: pointer;
  margin-left: 30px;
}
/* Landing CSS */
.landing {
  display: flex;
  flex-direction: row;
  justify-content: space-between;
  align-items: center;
  padding: 0 10vw 0 10vw;
  height: 90vh;
}
.landingText h1 {
  font-size: 4vw;
  margin: 0 !important;
}
.landingText h3 {
  margin: 6px !important;
  font-size: 15px;
  line-height: 1.8;
  color: #777777;
```

```
  font-family: "Playfair Display", serif;
  padding-right: 20px;
}
.landingText .btn2 {
  width: 120px;
  margin-top: 30px;
  padding: 14px 20px 12px 20px;
  background-color: #007bff;
  border-radius: 45px;
  text-align: center;
}
.landingText .btn2 a {
  font-size: 1.2vw;
  color: #fff;
}
.landingImage img {
  width: 42vw;
}


/*Services Css*/
.about {
  height: 600px;
  padding: 30px 50px 30px 50px;
  display: flex;
  flex-direction: row;
```

```
  justify-content: space-evenly;
  align-items: center;
}
.aboutText {
  position: relative;
  padding: 0 50px;
  height: inherit;
}
.aboutText h1 {
  position: relative;
  left: 110px;
}
.aboutText img {
  width: 42vw;
  position: absolute;
  top: 50px;
}
.aboutList {
  width: 50%;
}
ol {
  list-style-type: none;
  color: #e0501b;
}
ol li {
```

```
  font-size: 34px;
  position: relative;
  margin-bottom: 20px;
  border-bottom: 1px solid #ebebeb;
}
li p {
  font-size: 16px;
  color: #000;
  padding-left: 60px;
  line-height: 30px;
  opacity: 0.6;
}
li span {
  position: absolute;
  line-height: 25px;
  font-weight: 600;
}

/*Info Section*/
.infoSection {
  height: 600px;
}
.infoHeader {
  text-align: center;
  margin-bottom: 40px;
```

```
}
.infoCards {
  display: flex;
  flex-direction: row;
  justify-content: space-around;
  align-items: center;
  padding: 40px 0 40px 0;
}
.infoCards .card {
  position: relative;
  height: 360px;
  width: 360px;
  background: #fff;
  box-shadow: 0 10px 22px rgba(0, 0, 0, 0.9);
}
.infoCards .one .cardoneImg {
  width: 150px;
  position: absolute;
  top: -50px;
  right: -50px;
}
.infoCards .two .cardtwoImg {
  width: 150px;
  position: absolute;
  top: -50px;
```

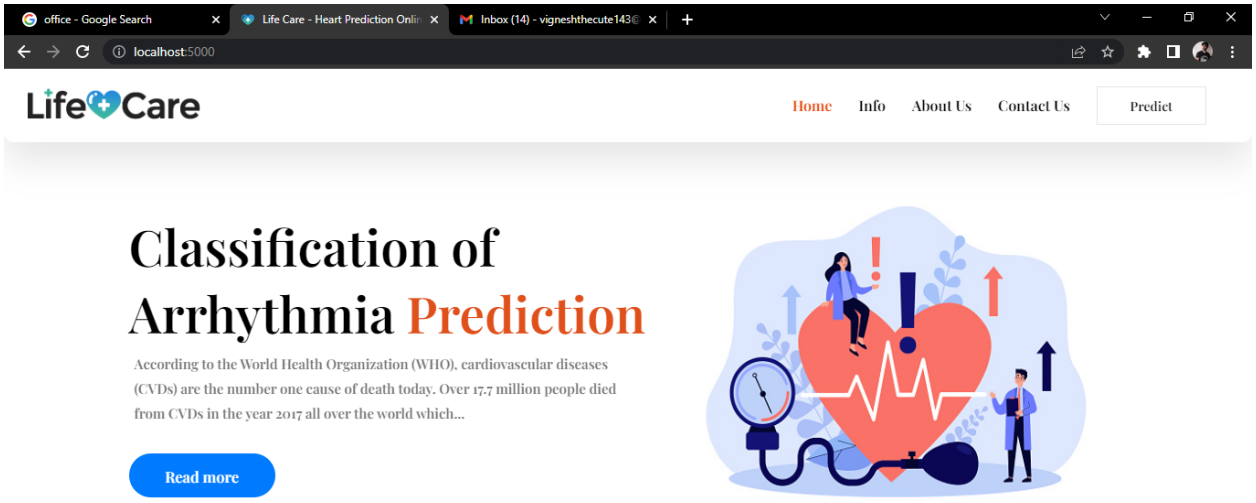
```
  right: -50px;
}
.infoCards .three .cardthreeImg {
  width: 150px;
  position: absolute;
  top: -50px;
  right: -30px;
}
.cardbgone {
  height: 150px;
  border-color: #fff;
}
.cardbgtwo {
  height: 150px;
  background-color: #fff;
}
.cardbgthree {
  height: 150px;
  background-color: #fff;
}
.cardContent {
  padding: 0 20px;
}
.cardContent p {
  line-height: 30px;
```

```
  opacity: 0.6;
}
.cardContent .cardBtn {
  position: absolute;
  right: 20px;
  padding: 10px;
  background-color: #ededed;
  width: 25px;
  height: 20px;
  border-radius: 6px;
  display: flex;
  justify-content: center;
  align-items: center;
  transition: all ease-in-out 0.2s;
}
.cardContent .cardBtn:hover {
  border-color: #2f8be0;
}
.cardContent .cardBtn .cardIcon {
  position: relative;
  top: 0px;
  left: 0px;
  width: 16px;
}
```

```css
/*Banner Css*/

.banner {

  height: 400px;

  background-color: #2f8be0;

  display: flex;

  flex-direction: row;

  padding: 50px;

  justify-content: space-evenly;

  align-items: center;

}

.bannerText h1 {

  font-size: 3vw;

  color: #000;

  font-weight: 600;

}

.bannerText img {

  width: 10vw;

  margin-right: 20px;

}

.bannerImg img {

  width: 20vw;

}

/*Footer Css*/

.footer {

  height: 100px;
```

```
  display: flex;
  flex-direction: column;
  align-items: center;
  padding-bottom: 20px;
}
.footerlinks a {
  margin: 20px;
  font-size: 16px;
  font-weight: 600;
  color: #000;
}
.footer .mainLink {
  color: #e0501b;
}
.footer a:hover {
  color: #007bff;
}
```

Output



Info.html

```
<!DOCTYPE html>

<html lang="en">



<head>

    <meta charset="UTF-8" />

    <meta http-equiv="X-UA-Compatible" content="IE=edge" />

    <meta name="viewport" content="width=device-width, initial-scale=1.0"
/>

    <title>Life Care - About Classification of Arrhythmia</title>

    <link rel="shortcut icon" href="{{url_for('static',
filename='images/fevicon.png' )}}" type="image/x-icon">

    <link rel="stylesheet"
href="https://cdnjs.cloudflare.com/ajax/libs/aos/2.3.1/aos.css" />
```

```
    <link
href="https://fonts.googleapis.com/css2?family=Playfair+Display:wght@600&d
isplay=swap" rel="stylesheet" />

    <link rel="stylesheet" href="{{url_for('static',
filename='css/style.css' )}}" />

    <script src="https://kit.fontawesome.com/64d58efce2.js"
crossorigin="anonymous">

    </script>

    <style>

        .banner {

            margin: 60px;

            width: auto;

            height: 300px;

            /* Setup */

            background-color: #fff;

            box-shadow: rgba(0, 0, 0, 0.15) 2.4px 2.4px 3.2px;

            display: flex;

            flex-direction: row;

            padding: 50px;

        }


        .bannerText h1 {

            font-size: 3vw;

            color: #007bff;

            font-weight: 600;

        }
```

```
        .bannerText p {
            text-indent: 50px;
            color: #777777;
            font-size: 1.2vw;
            font-weight: normal
        }

        .bannerText img {
            width: 10vw;
            margin-right: 20px;
        }

        .bannerImg img {
            margin-left: 90px;
            width: 350px;
        }
    </style>
</head>

<body>
    <div class="wrapper">
        <!--Navigation Bar-->
        <div class="nav">
            <div class="logo">
```

```
                <a href="/"><img src="static/images/logo.png" alt="Website
Title" style="width:190px" /></a>

            </div>

            <div class="links">

                <a href="/home">Home</a>

                <a href="/info" class="mainLink">info</a>

                <a href="/about">About Us</a>

                <a href="/contact">Contact Us</a>

                <a href="/upload" class="btn1">Predict</a>

            </div>

        </div>

        <!--Landing Page-->

        <div class="landing">

            <div class="landingText" data-aos="fade-up"
data-aous-duration="1000">

                <h1>

                    Classification of Arrhythmia

                    <span style="color: #e0501b; font-size:
4vw">Prediction</span>

                </h1>

                <h3>

                    According to the World Health Organization (WHO),
cardiovascular diseases (CVDs) are the number one

                    cause of death

                    today. Over 17.7 million people died from CVDs in the
year 2017 all over the world which is about

                    31% of all deaths, and
```

```
                    over 75% of these deaths occur in low and
middle-income countries. Arrhythmia is a representative

                    type of CVD that

                    refers to any irregular change from the normal heart
rhythms. There are several types of arrhythmia

                    including atrial

                    fibrillation, premature contraction, ventricular
fibrillation, and tachycardia. Although a single

                    arrhythmia heartbeat

                    may not have a serious impact on life, continuous
arrhythmia beats can result in fatal

                    circumstances.

                </h3>

            </div>

            <div class="landingImage" data-aos="fade-down"
data-aous-duration="2000">

                <img src="static/images/banner_img.jpg" alt="bannerImg"
style="width: 500px; height:360px" />

            </div>

        </div>

        <div class="banner">

            <div class="bannerText" data-aos="fade-right"
data-aous-duration="1000">

                <h1>

                    Left Bundle Branch

                </h1>

                <p>A delay blockage of electrical impulses
```

```
                    to the left of the heart. Left bundle brach block
sometimes

                    makes it harder for the heart to pump

                    blood efficiently through the circulatory

                    system.</p>

                <p>Most people don't have symptoms. If

                    symtoms occur, they inlcude fainting or

                    a slow heart rate.</p>

                <p>If there's an underlying condition, such

                    as heart disease, that condition needs

                    treatment. In patients with heart failure,

                    a pacemaker can also relieve symptoms as

                    well as prevent death.</p>

            </div>

            <div class="bannerImg" data-aos="fade-up"
data-aous-duration="1000">

                <img src="static/images/LBB.svg" alt="" />

            </div>

        </div>

        <div class="banner">

            <div class="bannerText" data-aos="fade-right"
data-aous-duration="1000">

                <h1>

                    Normal

                </h1>

                <p>Note that the heart is beating
```

```
                    in a regular sinus rhythm
                    between 60-100 beats per
                    minute (specifically 82 bpm).</p>
                <p>All the important intervals
                    on this recording are within
                    normal ranges.</p>
                <p>The normal ECG
                    patterns seen in children
                    differ considerably from those
                    in adults.</p>
            </div>
            <div class="bannerImg" data-aos="fade-up"
data-aous-duration="1000">
                <img src="static/images/normal.svg" alt="" />
            </div>
        </div>
        <div class="banner">
            <div class="bannerText" data-aos="fade-right"
data-aous-duration="1000">
                <h1>
                    Premature Atrial Contraction
                </h1>
                <p>usually, premature artial contraction have
                    no clear cause and no health risks. In most
                    cases, premature artrial contractions aren't a
                    sign of heart disease and just happen
```

```
                    naturally.</p>
                <p>But some people who have PACs turn out to
                    have related heart conditions, such as
                    Cardiomyopathy (a weakend heart muscle)
                    Caronary heart disease (fatty deposits in you blood
vessels)</p>
            </div>
            <div class="bannerImg" data-aos="fade-up"
data-aous-duration="1000">
                <img src="static/images/PAC.jpg" alt="" />
            </div>
        </div>
        <div class="banner">
            <div class="bannerText" data-aos="fade-right"
data-aous-duration="1000">
                <h1>
                    Premature Ventricular Contractions
                </h1>
                <p>Extra, abnorma heartbeats that begininone of the
                    Heart's two lower chambers.</p>
                <p>Premature ventricular contractions (PVCs) occur
                    in most people at some point. Causes may include
certain
                    medication, alcohol, some illegal drugs, caffeine,
                    tobacco, excercise or anxiety.</p>
                <p>
```

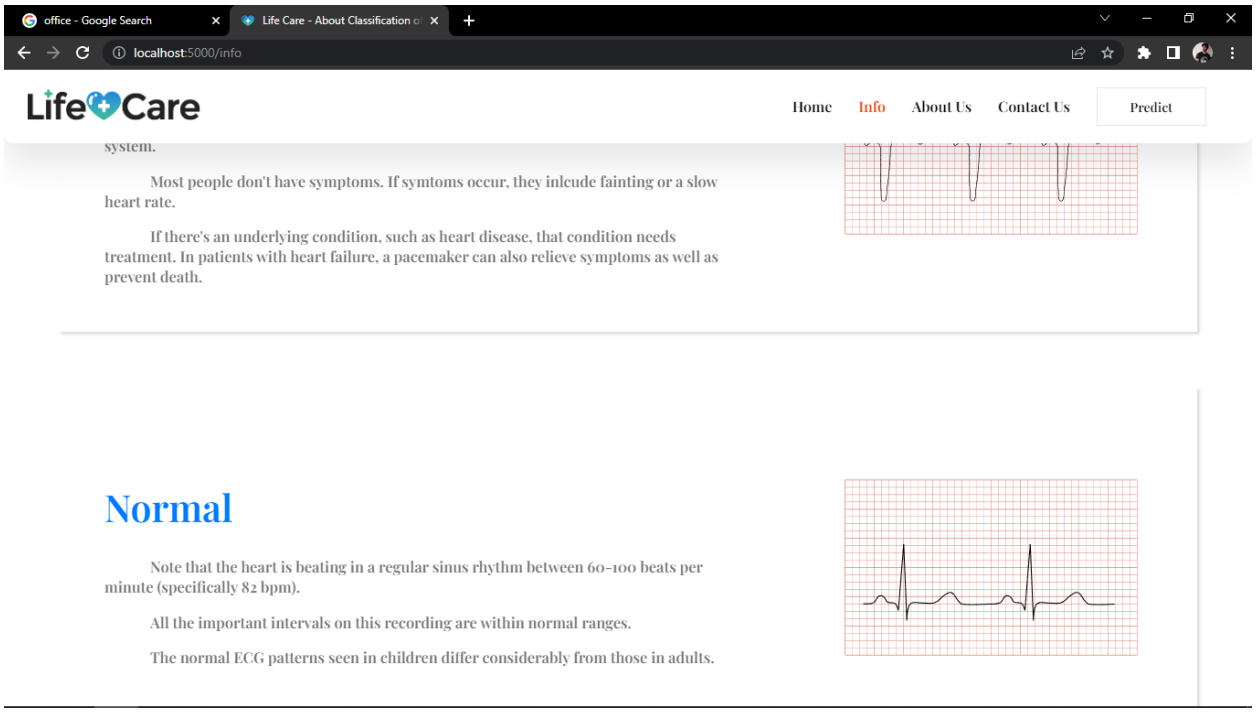
```
                    PVCs often cause no symtoms. When symptoms do
                    occur, they feel like a flip-flop or skipped-beat
                    sensation in the chest.
                </p>
                <p>Most people with isolated PVCs and an otherwise
                    normal heart don't need treatment. PVCs occurring
                    continuously serious cardiac than 30 seconds is a
                    potentially serious cardiac condition known as
                    ventriclular tachycardia.</p>
            </div>
            <div class="bannerImg" data-aos="fade-up"
data-aous-duration="1000">
                <img src="static/images/PVC.jpg" alt="" />
            </div>
        </div>
        <div class="banner">
            <div class="bannerText" data-aos="fade-right"
data-aous-duration="1000">
                <h1>
                    Right Bundle Branch
                </h1>
                <p>Right bundle branch block is associated with
                    structural changes from strech or ischemia to
                    the myocardium. It can also occur
                    iatorgenically from certain common cardiac
                    precedures, such as right heart catheterization.</p>
```

```
                <p>Although there is no significant association
                    with cardiovascular risk factors, the presence
                    with cardiovascular risk factors, the presence
                    of a right bundle branch block is a predictor of
                    mortality in myocardial infarction, heart
                    failure, and certain heart blocks.</p>
                <p>In asymptomatic patients, isolated right bundle
                    brach block typically does not need further
                    evaluation.</p>
            </div>
            <div class="bannerImg" data-aos="fade-up"
data-aous-duration="1000">
                <img src="static/images/RBB.svg" alt="" />
            </div>
        </div>
        <div class="banner">
            <div class="bannerText" data-aos="fade-right"
data-aous-duration="1000">
                <h1>
                    Ventricular Fibrillation
                </h1>
                <p>A life-threatening heart rhythm that results in a
                    rapid, inadeuate heartbeat.</p>
                <p>Ventricular fibrillation (VF) is a rapid,
                    Life-threatening heart rhythm starting in the bottom
```

```
                    chambers of the heart. It can be triggered by a heart
attack.</p>

                <p>Because the heart doesn't pump adequately during
                    ventricular fibrillation, sustained VF can cause
                    low blood pressure, losso f consciousness of
death.</p>

                <p>Emergency treatment includes immediate
                    defibrillation with a n automated external
                    defibrillator (AED) and cardiopulmonary
                    resuscitation(CPR). Long-term therapy includes
                    implantable defibrillators and medcations to
                    prevent recurrence.</p>

            </div>

            <div class="bannerImg" data-aos="fade-up"
data-aous-duration="1000">

                <img src="static/images/VF.png" alt="" />

            </div>

        </div>

        <div class="footer">

            <h1>LifeCare</h1>

            <div class="footerlinks">

                <a href="/home">Home</a>

                <a href="/info" class="mainLink">Info</a>

                <a href="/about">About Us</a>

                <a href="/conduct">Contact Us</a>

            </div>
```

```
        </div>
    </div>
    <script
src="https://cdnjs.cloudflare.com/ajax/libs/aos/2.3.1/aos.js"></script>
    <script>
        AOS.init();
    </script>
</body>


</html>
```

Output



about.html

```
<!DOCTYPE html>

<html lang="en">



<head>

    <meta charset="UTF-8">

    <meta http-equiv="X-UA-Compatible" content="IE=edge">

    <meta name="viewport" content="width=device-width, initial-scale=1.0">

    <link rel="shortcut icon" href="{{url_for('static',
filename='images/fevicon.png' )}}" type="image/x-icon">

    <title>Life Care - About Us</title>

    <link rel="stylesheet" href="{{url_for('static',
filename='css/about.css')}}">

    <link rel="stylesheet" href="{{url_for('static',
filename='css/style.css')}}">

    <link rel="stylesheet"
href="https://cdnjs.cloudflare.com/ajax/libs/aos/2.3.1/aos.css" />

    <link
href="https://fonts.googleapis.com/css2?family=Playfair+Display:wght@600&d
isplay=swap" rel="stylesheet" />

    <link
href="https://cdnjs.cloudflare.com/ajax/libs/font-awesome/5.10.0/css/all.m
in.css" rel="stylesheet">

</head>

<style>

    .footer {

        margin-bottom: 20px;

    }
```

```
    h1 {
        margin: 21.44px 0px;
    }
</style>

<body>
    <div class="wrapper">
        <!--Navigation Bar-->
        <div class="nav">
            <div class="logo">
                <a href="/"><img src="static/images/logo.png" alt="Website
Title" style="width:190px" /></a>
            </div>
            <div class="links">
                <a href="/">Home</a>
                <a href="/info">Info</a>
                <a href="/about" class="mainLink">About Us</a>
                <a href="/contact">Contact Us</a>
                <a href="/upload" class="btn1">Predict</a>
            </div>
        </div>
        <div class="landing">
            <div class="landingText" data-aos="fade-up"
data-aous-duration="1000">
                <h1>
```

```
                    We are a team of

                    <span style="color: #e0501b; font-size: 4vw">Arrthymia
Prediction</span>

                </h1>

                <h3>

                    In this project, we build an effective
electrocardiogram (ECG) arrhythmia classification method

                    using a convolutional

                    neural network (CNN), in which we classify ECG into
seven categories, one being normal and the other

                    six being different

                    types of arrhythmia using deep two-dimensional CNN
with grayscale ECG images. We are creating a web

                    application where

                    the user selects the image which is to be classified.
The image is fed into the model that is

                    trained and the cited

                    class will be displayed on the webpage.

                </h3>

            </div>

            <div class="landingImage" data-aos="fade-down"
data-aous-duration="2000">

                <img src="static/images/about_us.png" alt="aboutImg"
style="width: 450px; height:450px" />

            </div>

        </div>

        <div class="main">

            <div class="profile-card">
```

```
                <div class="img">
                    <img src="static/images/profile_avatar.png">
                </div>
                <div class="caption">
                    <h3>Muthamizhan</h3>
                    <p>Back End Developer, Dl Engineer</p>
                    <div class="social-links">
                        <a href="#"><i class="fab fa-facebook"></i></a>
                        <a href="#"><i class="fab fa-instagram"></i></a>
                        <a href="#"><i class="fab fa-twitter"></i></a>
                    </div>
                </div>
            </div>
            <div class="profile-card">
                <div class="img">
                    <img src="static/images/profile_avatar.png">
                </div>
                <div class="caption">
                    <h3>Vignesh Champ</h3>
                    <p>Full Stack Developer, Web Designer, Deep Learning
Engineer</p>
                    <div class="social-links">
                        <a href="#"><i class="fab fa-facebook"></i></a>
                        <a
href="https://www.instagram.com/the_._._champ/"><i class="fab
fa-instagram"></i></a>
```

```
                    <a href="#"><i class="fab fa-twitter"></i></a>
                </div>
            </div>
        </div>
        <div class="profile-card">
            <div class="img">
                <img src="static/images/profile_avatar.png">
            </div>
            <div class="caption">
                <h3>Vetriselvan</h3>
                <p>Back End Developer</p>
                <div class="social-links">
                    <a href="#"><i class="fab fa-facebook"></i></a>
                    <a href="#"><i class="fab fa-instagram"></i></a>
                    <a href="#"><i class="fab fa-twitter"></i></a>
                </div>
            </div>
        </div>
        <div class="profile-card">
            <div class="img">
                <img src="static/images/profile_avatar.png">
            </div>
            <div class="caption">
                <h3>Bharathidasan</h3>
                <p>Front End Developer</p>
```

```
                    <div class="social-links">
                        <a href="#"><i class="fab fa-facebook"></i></a>
                        <a href="#"><i class="fab fa-instagram"></i></a>
                        <a href="#"><i class="fab fa-twitter"></i></a>
                    </div>
                </div>
            </div>
        </div>
        <div class="footer">
            <h1>LifeCare</h1>
            <div class="footerlinks">
                <a href="/home">Home</a>
                <a href="/info">Info</a>
                <a href="/about">About Us</a>
                <a href="/contact">Contact Us</a>
            </div>
        </div>
    </div>


    </div>
    <script
src="https://cdnjs.cloudflare.com/ajax/libs/aos/2.3.1/aos.js"></script>
    <script>
        AOS.init();
    </script>
```

```
</body>


</html>
```

about.css

```
* {
  text-decoration: none !important;
  margin: 0;
  padding: 0;
  box-sizing: border-box;
}

@font-face {
  font-family: Exo;
  src: url(./fonts/Exo2.0-Medium.otf);
}

.main {
  height: 400px;
  margin: 60px;
  background-color: #2f8be0;
  display: flex;
  flex-direction: row;
  padding: 50px;
  justify-content: space-evenly;
```

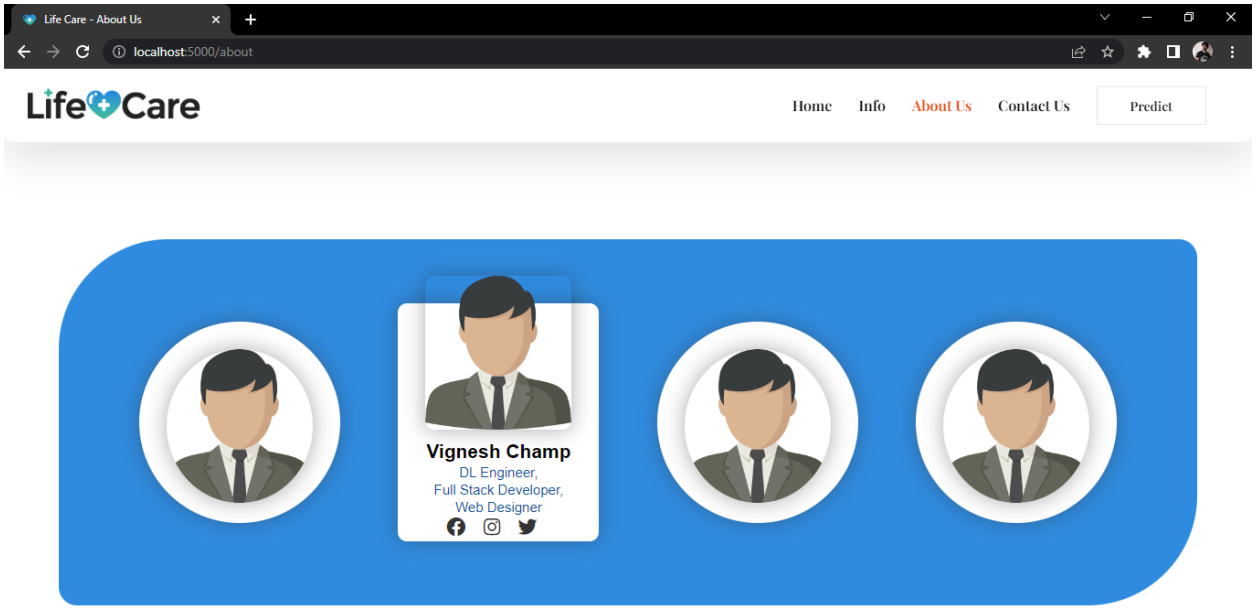
```
  align-items: center;
  border-radius: 120px 20px;
}

.profile-card {
  position: relative;
  font-family: sans-serif;
  width: 220px;
  height: 220px;
  background: #fff;
  padding: 30px;
  border-radius: 50%;
  box-shadow: 0 0 22px #3336;
  transition: 0.6s;
  margin: 0 25px;
}

.profile-card:hover {
  border-radius: 10px;
  height: 260px;
}

.profile-card .img {
  position: relative;
  width: 100%;
```

```
  height: 100%;
  transition: 0.6s;
  z-index: 99;
}

.profile-card:hover .img {
  transform: translateY(-60px);
}

.img img {
  width: 100%;
  border-radius: 50%;
  box-shadow: 0 0 22px #3336;
  transition: 0.6s;
}

.profile-card:hover img {
  border-radius: 10px;
}

.caption {
  text-align: center;
  transform: translateY(-80px);
  opacity: 0;
  transition: 0.6s;
```

```
}


.profile-card:hover .caption {
  opacity: 1;
}


.caption h3 {
  font-size: 21px;
  font-family: sans-serif;
}


.caption p {
  font-size: 15px;
  color: #0c52a1;
  font-family: sans-serif;
  margin: 2px 0 9px 0;
}


.caption .social-links a {
  color: #333;
  margin-right: 15px;
  font-size: 21px;
  transition: 0.6s;
}
```

```
.social-links a:hover {

  color: #0c52a1;

}
```

Output



contact.html

```
<!DOCTYPE html>

<html lang="en">



<head>

    <meta charset="UTF-8">

    <meta http-equiv="X-UA-Compatible" content="IE=edge">

    <meta name="viewport" content="width=device-width, initial-scale=1.0">
```

```
    <link rel="shortcut icon" href="{{url_for('static',
filename='images/fevicon.png' )}}" type="image/x-icon">

    <link rel="stylesheet"
href="https://cdnjs.cloudflare.com/ajax/libs/aos/2.3.1/aos.css" />

    <link rel="stylesheet"
href="https://cdnjs.cloudflare.com/ajax/libs/font-awesome/5.15.3/css/all.m
in.css" />

    <link
href="https://fonts.googleapis.com/css2?family=Playfair+Display:wght@600&d
isplay=swap" rel="stylesheet" />

    <link rel="stylesheet" href="{{url_for('static',
filename='css/contact.css' )}}" />

    <link rel="stylesheet" href="{{url_for('static',
filename='css/style.css' )}}" />

    <title>Life Care - Contact US</title>

</head>



<body>

    <div class="wrapper">

        <div class="nav">

            <div class="logo">

                <a href="/">

                    <img src="static\images\logo.png" style="width:190px"
/>

                </a>

            </div>

            <div class="links">

                <a href="/home" class="mainLink">Home</a>
```

```
                <a href="/info">Info</a>
                <a href="/about">About Us</a>
                <a href="/contact">Contact Us</a>
                <a href="/upload" class="btn1">Predict</a>
            </div>
        </div>
        <div class="container" data-aos="fade-down"
data-aous-duration="1000">
            <div class="image" data-aos="fade-right"
data-aous-duration="6000">
                <img src="static/images/contact.png" alt="">
            </div>
            <div class="form-area">
                <h2>Contact US</h2>
                <form action="{{url_for('send_message')}}" method="post">
                    <input type="text" name="name" placeholder="Full
Name">
                    <input type="email" name="email" placeholder="Email">
                    <input type="text" name="subject"
placeholder="Subject">
                    <textarea cols="30" name="message" rows="3"
placeholder="Your Message"></textarea>
                    <button type="submit">Send Message</button>
                </form>
            </div>
        </div>
    </div>
```

```
    <script
src="https://cdnjs.cloudflare.com/ajax/libs/aos/2.3.1/aos.js"></script>

    <script>

        AOS.init();

    </script>

</body>


</html>
```

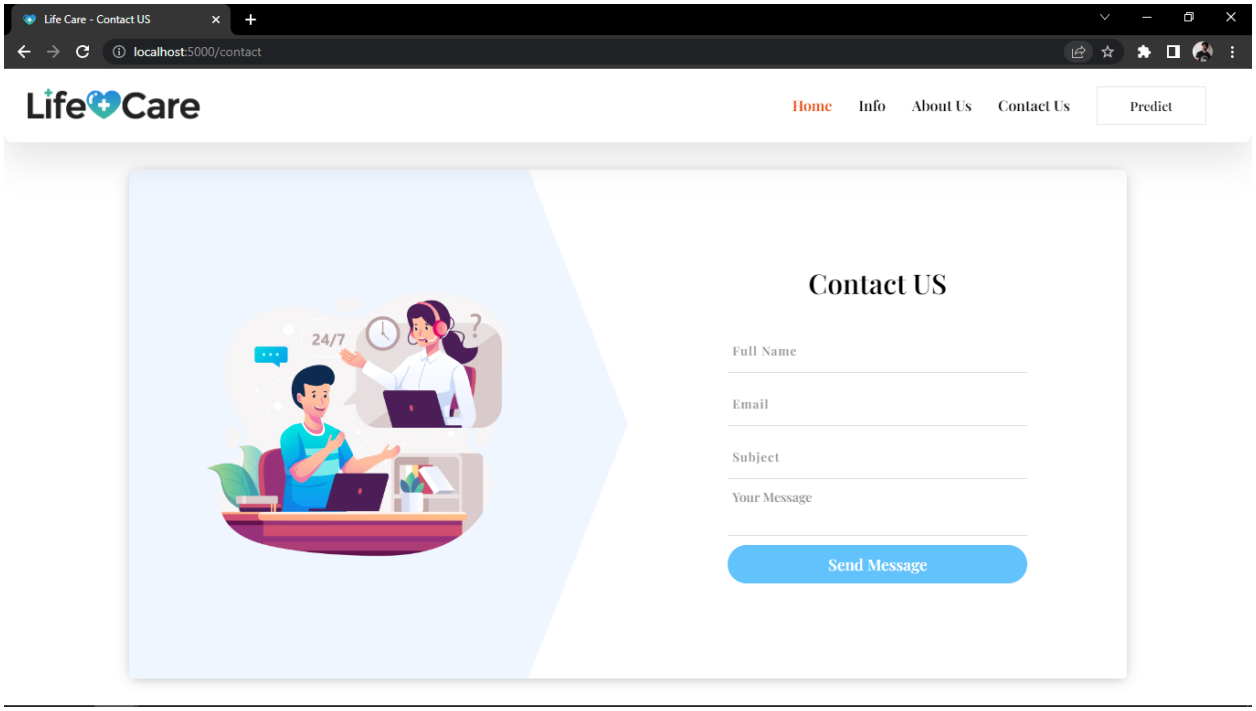
contact.css

```
<!DOCTYPE html>

<html lang="en">



<head>

    <meta charset="UTF-8">

    <meta http-equiv="X-UA-Compatible" content="IE=edge">

    <meta name="viewport" content="width=device-width, initial-scale=1.0">

    <link rel="shortcut icon" href="{{url_for('static',
filename='images/fevicon.png' )}}" type="image/x-icon">

    <link rel="stylesheet"
href="https://cdnjs.cloudflare.com/ajax/libs/aos/2.3.1/aos.css" />

    <link rel="stylesheet"
href="https://cdnjs.cloudflare.com/ajax/libs/font-awesome/5.15.3/css/all.m
in.css" />

    <link
href="https://fonts.googleapis.com/css2?family=Playfair+Display:wght@600&d
isplay=swap" rel="stylesheet" />
```

```
    <link rel="stylesheet" href="{{url_for('static',
filename='css/contact.css' )}}" />

    <link rel="stylesheet" href="{{url_for('static',
filename='css/style.css' )}}" />

    <title>Life Care - Contact US</title>

</head>


<body>

    <div class="wrapper">

        <div class="nav">

            <div class="logo">

                <a href="/">

                    <img src="static\images\logo.png" style="width:190px"
/>

                </a>

            </div>

            <div class="links">

                <a href="/home" class="mainLink">Home</a>

                <a href="/info">Info</a>

                <a href="/about">About Us</a>

                <a href="/contact">Contact Us</a>

                <a href="/upload" class="btn1">Predict</a>

            </div>

        </div>

        <div class="container" data-aos="fade-down"
data-aous-duration="1000">
```

```
            <div class="image" data-aos="fade-right"
data-aous-duration="6000">

                <img src="static/images/contact.png" alt="">

            </div>

            <div class="form-area">

                <h2>Contact US</h2>

                <form action="{{url_for('send_message')}}" method="post">

                    <input type="text" name="name" placeholder="Full
Name">

                    <input type="email" name="email" placeholder="Email">

                    <input type="text" name="subject"
placeholder="Subject">

                    <textarea cols="30" name="message" rows="3"
placeholder="Your Message"></textarea>

                    <button type="submit">Send Message</button>

                </form>

            </div>

        </div>

    </div>

    <script
src="https://cdnjs.cloudflare.com/ajax/libs/aos/2.3.1/aos.js"></script>

    <script>

        AOS.init();

    </script>

</body>


</html>
```

Output



predict_base.html

```
<!DOCTYPE html>

<html lang="en">



<head>

    <meta charset="UTF-8" />

    <meta http-equiv="X-UA-Compatible" content="IE=edge" />

    <meta name="viewport" content="width=device-width, initial-scale=1.0"
/>

    <title>Life Care - Heart Prediction Online</title>

    <link rel="shortcut icon" href="{{url_for('static',
filename='images/fevicon.png' )}}" type="image/x-icon">
```

```
    <link rel="stylesheet"
href="https://cdnjs.cloudflare.com/ajax/libs/aos/2.3.1/aos.css" />

    <link
href="https://fonts.googleapis.com/css2?family=Playfair+Display:wght@600&d
isplay=swap" rel="stylesheet" />

    <script
src="https://cdn.bootcss.com/popper.js/1.12.9/umd/popper.min.js"></script>

    <script
src="https://cdn.bootcss.com/jquery/3.3.1/jquery.min.js"></script>

    <script
src="https://cdn.bootcss.com/bootstrap/4.0.0/js/bootstrap.min.js"></script
>

    <link href="{{ url_for('static', filename='css/main.css') }}"
rel="stylesheet">

    <link rel="stylesheet" href="{{url_for('static',
filename='css/style.css' )}}" />

    <script src="https://kit.fontawesome.com/64d58efce2.js"
crossorigin="anonymous">

    </script>

</head>



<body>

    <div class="wrapper">

        <!--Navigation Bar-->

        <div class="nav">

            <div class="logo">

                <a href="/">

                    <img src="static\images\logo.png" style="width:190px"
/>
```

```
                </a>
            </div>
            <div class="links">
                <a href="/">Home</a>
                <a href="/info">Info</a>
                <a href="/about">About Us</a>
                <a href="/contact">Contact Us</a>
                <a href="/upload" class="btn1">Predict</a>
            </div>
        </div>
        <!--Landing Page-->
        <div class="landing">
            <div class="landingText" data-aos="fade-up"
data-aous-duration="10000">
                <h1>
                    Classification of Arrhythmia
                    <span style="color: #e0501b; font-size:
4vw">Prediction</span>
                </h1>
                <h3>
                    According to the World Health Organization (WHO),
cardiovascular diseases (CVDs) are the number one
                    cause of
                    death today. Over 17.7 million people died from CVDs
in the
                    year 2017 all over the world which...
```

```
                </h3>


                <div class="btn2"><a href="/info">Read more</a>

                </div>

            </div>

            <div class="landingImage" data-aos="fade-down"
data-aous-duration="2000">

                <img src="static/images/banner_img.jpg" alt="bannerImg"
style="width: 500px; height:360px" />

            </div>

        </div>


        <div class="about">

            <div class="aboutText" data-aos="fade-up"
data-aous-duration="1000">

                {% block content %}{% endblock %}

            </div>

        </div>


        <div class="footer">

            <h1>LifeCare</h1>

            <div class="footerlinks">

                <a href="/home">Home</a>

                <a href="/info">Info</a>

                <a href="/about">About Us</a>

                <a href="/contact">Contact Us</a>
```

```
            </div>

        </div>

    </div>



    <script
src="https://cdnjs.cloudflare.com/ajax/libs/aos/2.3.1/aos.js"></script>

    <script>

        AOS.init();

    </script>

</body>

<footer>

    <script src="{{ url_for('static', filename='js/main.js') }}"
type="text/javascript"></script>

</footer>



</html>
```

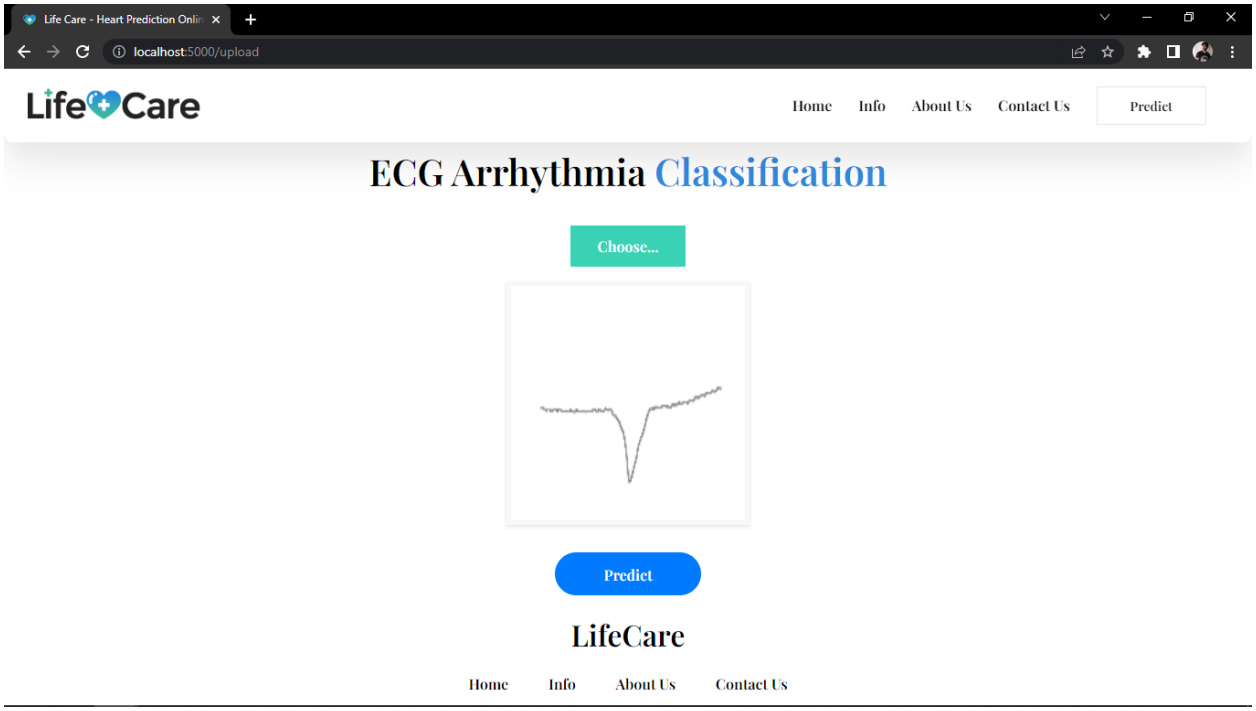
predict.html

```
{% extends "predict_base.html" %} {% block content %}



<center>

    <h2 style="font-size: 40px;">

        ECG Arrhythmia

        <span style="color: #2f8be0; font-size: 3vw">Classification</span>

    </h2>
```

```
</center>


<div>
    <form id="upload-file" method="post" enctype="multipart/form-data">
        <center> <label for="imageUpload" class="upload-label">
                Choose...
            </label>
            <input type="file" name="file" id="imageUpload" accept=".png,
.jpg, .jpeg">
        </center>
    </form>


    <center>
        <div class="image-section" style="display:none;">
            <div class="img-preview">
                <div id="imagePreview">
                </div>
            </div>
        </div>
    </center>
</div>
<center>
    <div class="btn3" id="btn-predict"
        style="padding: 8px 34px; width: 120px; margin-top: 30px; padding:
14px 20px 12px 20px; background-color: #007bff; border-radius: 45px;
text-align: center; color: #fff; cursor: pointer;">
```

```
        Predict</div>

    <div class="loader" style="display:none;"></div>

</center>


<h3 style="color:Black" id="result">

    <span> </span>

</h3>


</div>


</div>




{% endblock %}
```

Output



7.2 Feature 2 (Contact Form)

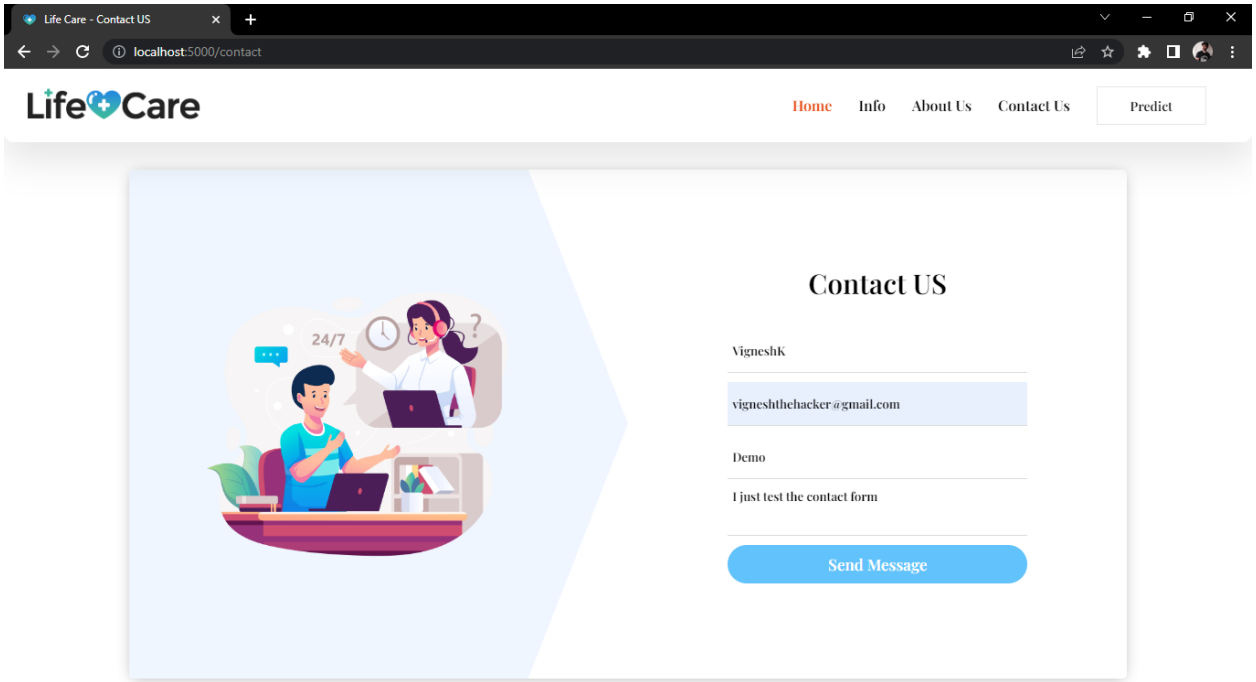
Coding (Backend)

```
from flask import Flask,render_template,request

from flask_mail import Mail,Message



app=Flask(__name__)#our flask app



app.config['MAIL_SERVER'] = 'smtp.gmail.com'

app.config['MAIL_PORT'] = 465

app.config['MAIL_USERNAME'] = 'teamarrhythmiaprediction@gmail.com'

app.config['MAIL_PASSWORD'] = 'wjolgozdhnafolyd'

app.config['MAIL_USE_TLS'] = False
```

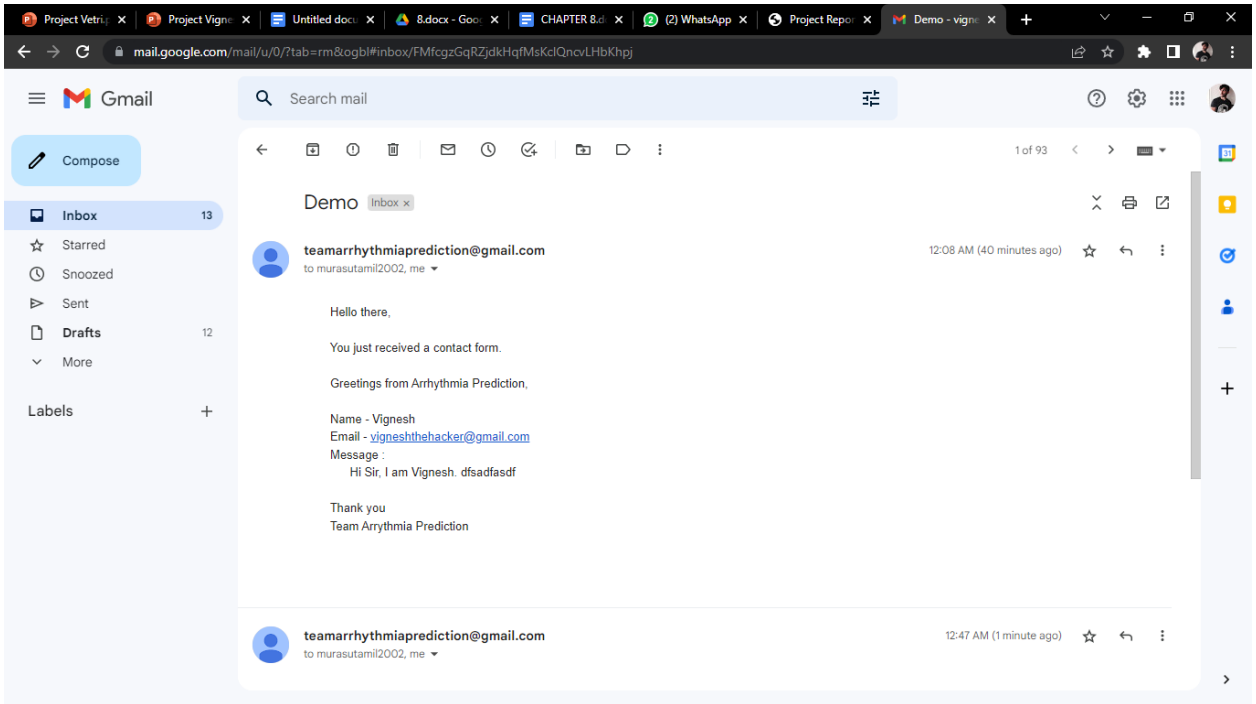
```
app.config['MAIL_USE_SSL'] = True



mail=Mail(app)

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

def send_message():

    if request.method=="POST":

        name = request.form['name']

        email = request.form['email']

        subject = request.form['subject']

        msg = request.form['message']

        message = Message(subject, sender=email,
recipients=['vigneshthecute143@gmail.com', 'murasutamil2002@gmail.com'])



        message.body="""

        Hello there,



        You just received a contact form.



        Greetings from Arrhythmia Prediction,



        Name - {}

        Email - {}

        Message :

              Hi Sir, I am {}. {}
```

```
        Thank you

        Team Arrythmia Prediction



        """.format(name,email,name,msg)


        mail.send(message)


        success = "Message Sent"


        return render_template("success.html",success=success)


if __name__=="__main__":

    app.run(debug=True)
```

Sample Output



Actual Output



CHAPTER 8

TESTING

8.1 Test Cases

A test case is a document, which has a set of test data, preconditions, expected results and postconditions, developed for a particular test scenario in order to verify compliance against a specific requirement. Test Case acts as the starting point for the test execution, and after applying a set of input values

8.1.1 Model Performance Test

S.No.	Parameter	Values
1.	Model Summary	We are creating a model for predicting 6 classification of ECG images.
2.	Accuracy	Training Accuracy - 100% Validation Accuracy - 99.8%

Screenshots:

1. Model Summary

```
[23]: model.summary()
```

```
Model: "sequential"
_________________________________________________________________
 Layer (type)                Output Shape              Param #
=================================================================
 conv2d (Conv2D)             (None, 62, 62, 32)        896

 max_pooling2d (MaxPooling2D  (None, 31, 31, 32)       0
 )

 conv2d_1 (Conv2D)           (None, 29, 29, 32)        9248

 max_pooling2d_1 (MaxPooling  (None, 14, 14, 32)       0
 2D)

 flatten (Flatten)           (None, 6272)              0

 dense (Dense)               (None, 128)               802944

 dense_1 (Dense)             (None, 128)               16512

 dense_2 (Dense)             (None, 128)               16512

 dense_3 (Dense)             (None, 128)               16512

 dense_4 (Dense)             (None, 128)               16512

 dense_5 (Dense)             (None, 6)                 774

=================================================================
Total params: 879,910
Trainable params: 879,910
Non-trainable params: 0
_________________________________________________________________
```

2. Accuracy

2.1 Training Accuracy

Train the model:

```
[25]: model.fit_generator(generator=x_train,steps_per_epoch = len(x_train), epochs=9, validation_data=x_test,validation_steps = len(x_test))
```

```
/usr/local/lib/python3.7/dist-packages/ipykernel_launcher.py:1: UserWarning: `Model.fit_generator` is deprecated and will be removed in a future versi
on. Please use `Model.fit`, which supports generators.
  """Entry point for launching an IPython kernel.
Epoch 1/9
480/480 [==============================] - 41s 66ms/step - loss: 1.3631 - accuracy: 0.5007 - val_loss: 1.6149 - val_accuracy: 0.4544
Epoch 2/9
480/480 [==============================] - 31s 65ms/step - loss: 0.7976 - accuracy: 0.6908 - val_loss: 0.9267 - val_accuracy: 0.6988
Epoch 3/9
480/480 [==============================] - 34s 71ms/step - loss: 0.3399 - accuracy: 0.8819 - val_loss: 0.6958 - val_accuracy: 0.7965
Epoch 4/9
480/480 [==============================] - 30s 63ms/step - loss: 0.2286 - accuracy: 0.9223 - val_loss: 0.5724 - val_accuracy: 0.8095
Epoch 5/9
480/480 [==============================] - 30s 63ms/step - loss: 0.1798 - accuracy: 0.9439 - val_loss: 0.4829 - val_accuracy: 0.8488
Epoch 6/9
480/480 [==============================] - 30s 63ms/step - loss: 0.1416 - accuracy: 0.9555 - val_loss: 0.5124 - val_accuracy: 0.8549
Epoch 7/9
480/480 [==============================] - 30s 62ms/step - loss: 0.1068 - accuracy: 0.9662 - val_loss: 0.5708 - val_accuracy: 0.8585
Epoch 8/9
480/480 [==============================] - 30s 63ms/step - loss: 0.0917 - accuracy: 0.9710 - val_loss: 0.4615 - val_accuracy: 0.8714
Epoch 9/9
480/480 [==============================] - 30s 62ms/step - loss: 0.0796 - accuracy: 0.9750 - val_loss: 0.7387 - val_accuracy: 0.8535
```

[25]:

2.2 Validation Accuracy

[32]:
```
img
```

[32]:


[33]:
```
import numpy as np
```

[34]:
```
x=np.expand_dims(x,axis=0)
```

[35]:
```
pred = model.predict(x)
y_pred=np.argmax(pred)
y_pred
```

```
1/1 [==============================] - 0s 151ms/step
```

[35]:
```
4
```

[36]:
```
index=['left Bundle Branch block',
       'Normal',
       'Premature Atrial Contraction',
       'Premature Ventricular Contraction',
       'Right Bundle Branch Block',
       'Ventricular Fibrillation']
```

[37]:
```
result = str(index[y_pred])
result
```

[37]:
```
'Right Bundle Branch Block'
```

8.2 User Acceptance Testing

Acceptance testing is a quality assurance (QA) process that determines to what degree an application meets end users' approval. Depending on the organization, acceptance testing might take the form of beta testing, application testing, field testing or end-user testing

Executing the model testing and deploying in the model on Watson Studio creating a new API for IBM cloud.After getting the API key used to connect with Watson Studio. Executing and store the model in cloud object storage.

8.2.1 Purpose of UAT

The purpose of UAT is to briefly explain the test coverage and open issues of the Classification of Arrhythmia by Using Deep Learning with 2-D ECG Spectral Image Representation project at the time of the release to User Acceptance Testing (UAT).

8.2.2 Defect Analysis

This report shows the number of resolved or closed bugs at each severity level, and how they were resolved

Resolution	Severity 1	Severity 2	Severity 3	Severity 4	Subtotal
By Design	10	3	2	4	19
Duplicate	0	0	2	0	2
External	0	0	0	1	1
Fixed	10	2	4	18	34
Not Reproduced	0	0	1	0	1
Skipped	0	0	1	1	2
Won't Fix	0	5	2	1	8
Totals	24	14	13	26	77

8.2.3 Test Case Analysis

This report shows the number of test cases that have passed, failed, and untested

Section	Total Cases	Not Tested	Fail	Pass
Print Engine	0	0	0	0
Client Application	51	0	0	51
Security	2	0	0	2
Outsource Shipping	3	0	0	3
Exception Reporting	9	0	0	9
Final Report Output	4	0	0	4
Version Control	2	0	0	2

CHAPTER 9

RESULTS

9. Results

Two hundred forty-two patients with arrhythmia who met the inclusion criteria were enrolled in this study. Of the enrolled patients, 14 were excluded because of detachment of an ECG electrode (N=5) or photoplethysmography sensor (N=3) or because their recordings lasted <10 minutes (N=6). Two hundred twenty-eight pairs of photoplethysmography and ECG recordings were obtained from the consenting patients (N=228; 1 recording for each patient). The 228 photoplethysmography recordings were divided into 158 355 10-second photoplethysmography segments; 127 562 of these were retained, whereas another 30 793 (19.4%) were removed because of their poor signal quality or the poor signal quality of their ECG reference data. Among the 127 562 clean photoplethysmography segments, 118 217 (92.7%) were labeled as having a definite rhythm by the 2 cardiologists. The remaining segments were unclassified, because the 2 cardiologists could not provide the correct category.

Specifically, the segments numbered the following for each label: 38 081 for sinus rhythm (SR), 11 372 for PVC, 11 248 for PAC, 5783 for VT (3 or more consecutive PVCs at a rate of >100 beats per minute), 12 539 for SVT (3 or more consecutive PACs at a rate of >100 beats per minute), and 39 194 for AF. To train the model accurately, we removed unclassified segments. Consequently, 228 recordings with 118 217 clean 10-second photoplethysmography segments collected from 228 patients (age, 52.3±11.3 years; 133 men) were retained in the final analysis. Each segment has only 1 identified rhythm type. Of the remaining 228 patients, we randomly separated 60% (N=137) into the training set, 20% (N=46) into the validation set, and 20% (N=45) into the test set. The segments included in the training, validation, and test sets were 71 390, 23 443, and 23 384, respectively. The baseline characteristics and the distribution of rhythm classes were similar among the 3 data sets. Examples of 10-second synchronous I-lead ECG and photoplethysmography signal segments for various rhythm types are presented.

CHAPTER 10

ADVANTAGES & DISADVANTAGES

10.1 Advantages

- ➢ The proposed model predicts Arrhythmia in images with a high accuracy rate of nearly 96%.
- ➢ The early detection of Arrhythmia gives better understanding of disease causes, initiates therapeutic interventions and enables developing appropriate treatments.
- ➢ It is useful for identifying the arrhythmia disease at an early stage.
- ➢ It is useful in detecting cardiovascular disorders.
- ➢ There is no need to go to the hospital.

10.2 Disadvantages

- ➢ Not useful for identifying the different stages of Arrhythmia disease.
- ➢ Not useful in monitoring motor symptoms.
- ➢ There are two major drawbacks of existing machine-learning approaches:
    - ❖ (a) they require extensive training time.
    - ❖ (b) they require manual feature selection.

CHAPTER 11

CONCLUSION

12. Conclusion

- ➢ Cardiovascular disease is a major health problem in today's world. The early diagnosis of cardiac arrhythmia highly relies on the ECG.

- ➢ Unfortunately, the expert level of medical resources is rare, visually identify the ECG signal is challenging and time-consuming.

- ➢ The advantages of the proposed CNN network have been put to evidence.

- ➢ It is endowed with an ability to effectively process the non-filtered dataset with its potential anti-noise features.

- ➢ Besides that, ten-fold cross-validation is implemented in this work to further demonstrate the robustness of the network.

- ➢ The framework used two deep neural networks in conjunction and merged them in a hierarchical layered structure to form a single robust model. The proposed approach was tested on the UCI Arrhythmia and MIT-BIH Arrhythmia datasets and benchmarked with the state-of-the-art approaches.

- ➢ The comparison of the selected evaluation metrics revealed the superior performance of the proposed approach over modern approaches.

- ➢ A comparison in terms of the execution time was also carried out to exhibit that the approach not only far outclasses the modern works in terms of accuracy, sensitivity, and specificity, but overall model execution time as well.

CHAPTER 12

FUTURE SCOPE

12. Future Scope

- ➢ For future work, it would be interesting to explore the use of optimization techniques to find a feasible design and solution.

- ➢ The limitation of our study is that we have yet to apply any optimization techniques to optimize the model parameters

- ➢ We believe that with the implementation of the optimization, it will be able to further elevate the performance of the proposed solution to the next level.

CHAPTER 13

APPENDIX

13.1 App.py

```
import os

import numpy as np  # used for numerical analysis

from flask import Flask, request, render_template

from flask_mail import Mail,Message

# Flask-It is our framework which we are going to use to run/serve our
application.

# request-for accessing file which was uploaded by the user on our
application.

# render_template- used for rendering the html pages

from tensorflow.keras.models import load_model  # to load our trained
model

from tensorflow.keras.preprocessing import image


app = Flask(__name__)  # our flask app

app.config['MAIL_SERVER'] = 'smtp.gmail.com'

app.config['MAIL_PORT'] = 465

app.config['MAIL_USERNAME'] = 'teamarrhythmiaprediction@gmail.com'

app.config['MAIL_PASSWORD'] = 'wjolgozdhnafolyd'

app.config['MAIL_USE_TLS'] = False

app.config['MAIL_USE_SSL'] = True

model = load_model('ECG.h5')  # loading the model
```

```
@app.route("/") #default route
@app.route("/home") #Home page set to default page
def default():
    return render_template('index.html') #rendering index.html

@app.route("/info") #route to info page
def information():
    return render_template("info.html") #rendering info.html

@app.route("/about") #route to about us page
def about_us():
    return render_template('about.html')  #rendering about.html

@app.route("/contact") #route to contact us page
def contact_us():
    return render_template('contact.html')  #rendering contact.html

@app.route("/upload") #default route
def test():
    return render_template("predict.html")  #rendering contact.html

@app.route("/predict",methods=["GET","POST"]) #route for our prediction
def upload():
    if request.method == 'POST':
```

```
        f = request.files['file']  # requesting the file

        basepath = os.path.dirname('__file__')  # storing the file
directory

        filepath = os.path.join(basepath, "uploads", f.filename)  #
storing the file in uploads folder

        f.save(filepath)  # saving the file


        img = image.load_img(filepath, target_size=(64, 64))  # load and
reshaping the image

        x = image.img_to_array(img)  # converting image to array

        x = np.expand_dims(x, axis=0)  # changing the dimensions of the
image


        preds = model.predict(x)  # predicting classes

        pred = np.argmax(preds, axis=1)  # predicting classes

        print("prediction", pred)  # printing the prediction


        index = ['Left Bundle Branch Block', 'Normal', 'Premature Atrial
Contraction',

                 'Premature Ventricular Contractions', 'Right Bundle
Branch Block', 'Ventricular Fibrillation']

        result = str(index[pred[0]])

        return result  # resturing the result

    return None



# port = int(os.getenv("PORT"))
```

```
if __name__ == "__main__":

    app.run(debug=False)  # running our app

    # app.run(host='0.0.0.0', port=8000)
```

Coding (Front end)

index.html

```
<!DOCTYPE html>

<html lang="en">



<head>

  <meta charset="UTF-8" />

  <meta http-equiv="X-UA-Compatible" content="IE=edge" />

  <meta name="viewport" content="width=device-width, initial-scale=1.0" />

  <title>Life Care - Heart Prediction Online</title>

  <link rel="shortcut icon" href="{{url_for('static',
filename='images/fevicon.png' )}}" type="image/x-icon">

  <link rel="stylesheet"
href="https://cdnjs.cloudflare.com/ajax/libs/aos/2.3.1/aos.css" />

  <link
href="https://fonts.googleapis.com/css2?family=Playfair+Display:wght@600&d
isplay=swap" rel="stylesheet" />

  <link rel="stylesheet" href="{{url_for('static',
filename='css/style.css' )}}" />

  <script src="https://kit.fontawesome.com/64d58efce2.js"
crossorigin="anonymous">

  </script>

</head>
```

```
<body>
  <div class="wrapper">
    <!--Navigation Bar-->
    <div class="nav">
      <div class="logo">
        <a href="/">
          <img src="static\images\logo.png" style="width:190px" />
        </a>
      </div>
      <div class="links">
        <a href="/home" class="mainLink">Home</a>
        <a href="/info">Info</a>
        <a href="/about">About Us</a>
        <a href="/contact">Contact Us</a>
        <a href="/upload" class="btn1">Predict</a>
      </div>
    </div>
    <!--Landing Page-->
    <div class="landing">
      <div class="landingText" data-aos="fade-up"
data-aous-duration="1000">
        <h1>
          Classification of Arrhythmia
          <span style="color: #e0501b; font-size: 4vw">Prediction</span>
```

```
        </h1>

        <h3>

          According to the World Health Organization (WHO), cardiovascular
diseases (CVDs) are the number one cause of

          death today. Over 17.7 million people died from CVDs in the

          year 2017 all over the world which...

        </h3>



        <div class="btn2"><a href="/info">Read more</a>

        </div>

      </div>

      <div class="landingImage" data-aos="fade-down"
data-aous-duration="2000">

        <img src="static/images/banner_img.jpg" alt="bannerImg"
style="width: 500px; height:360px" />

      </div>

    </div>



    <!--Service Section-->

    <div class="about">

      <div class="aboutText" data-aos="fade-up" data-aous-duration="1000">

        <h1 style="margin: 20px;">

          Our Patients Are at Centre

          <span style="color: #2f8be0; font-size: 3vw">of Every We
Do</span>

        </h1>
```

```
        <div class="image-container">
          <img src="/static/images/connsultPationt.png"
alt="consultPationt"
            style="width:400px; margin:100px 0px 0px 90px;"></img>
        </div>
      </div>
      <div class="aboutList" data-aos="fade-left"
data-aous-duration="1000">
        <ol>
          <li>
            <span>01</span>
            <p>99.8% accurate result.</p>
          </li>
          <li>
            <span>02</span>
            <p>No need to go hospital.</p>
          </li>
          <li>
            <span>03</span>
            <p>No need to login</p>
          </li>
          <li>
            <span>04</span>
            <p>24/7 Support.</p>
          </li>
        </ol>
```

```
      </div>

    </div>



    <!--Info Section-->

    <div class="infoSection">

      <div class="infoHeader" data-aos="fade-up"
data-aous-duration="1000">

        <h1>

          We Analyse Youe Health states <br /><span style="color:
#e0501b">In Order to Top Service.</span>

        </h1>

      </div>

      <div class="infoCards">

        <div class="card one" data-aos="fade-up"
data-aous-duration="1000">

          <img src="static/images/banner_1.svg" class="cardoneImg" alt=""
data-aos="fade-up"

            data-aous-duration="1100" />

          <div class="cardbgone"></div>

          <div class="cardContent">

            <h2>Health State</h2>

            <p>

              Easy to know Health state

            </p>

            <a href="/">

              <div class="cardBtn">
```

```
                <img src="static/images/next.png" alt="" class="cardIcon"
/>

              </div>

            </a>

          </div>

        </div>

        <div class="card two" data-aos="fade-up"
data-aous-duration="1300">

          <img src="static/images/banner_1.svg" class="cardtwoImg" alt=""
data-aos="fade-up"

            data-aous-duration="1200" />

          <div class="cardbgtwo"></div>

          <div class="cardContent">

            <h2>User Friendly</h2>

            <p>

              Easy for people to use, prediction

            </p>

            <a href="/">

              <div class="cardBtn">

                <img src="static/images/next.png" alt="" class="cardIcon"
/>

              </div>

            </a>

          </div>

        </div>

        <div class="card three" data-aos="fade-up"
data-aous-duration="1600">
```

```
          <img src="static/images/banner_1.svg" class="cardthreeImg"
alt="" data-aos="fade-up"
            data-aous-duration="1000" />
          <div class="cardbgthree"></div>
          <div class="cardContent">
            <h2>Classification of Arrhythmia</h2>
            <p>
              Prediction Classification of Arrhythmia
            </p>
            <a href="/upload">
              <div class="cardBtn">
                <img src="static/images/next.png" alt="" class="cardIcon"
/>
              </div>
            </a>
          </div>
        </div>
      </div>
    </div>


    <!--Banner And Footer-->
    <div class="banner">
      <div class="bannerText" data-aos="fade-right"
data-aous-duration="1000">
        <h1>
```

```
          Download the LifeCare App Today <br /><span style="font-size:
1.6vw; font-weight: normal"

            class="bannerInnerText">Stay Updated and get all your medical
needs taken care of!</span>

        </h1>

        <a href="/"><img src="static/images/AndroidPNG.png" alt="" /></a>

        <a href="/"><img src="static/images/iosPNG.png" alt="" /></a>

      </div>

      <div class="bannerImg" data-aos="fade-up" data-aous-duration="1000">

        <img src="static/images/app.png" alt="" />

      </div>

    </div>


    <div class="footer">

      <h1>LifeCare</h1>

      <div class="footerlinks">

        <a href="/home" class="mainLink">Home</a>

        <a href="/info">Info</a>

        <a href="/about">About Us</a>

        <a href="/contact">Contact Us</a>

      </div>

    </div>

  </div>

  <script
src="https://cdnjs.cloudflare.com/ajax/libs/aos/2.3.1/aos.js"></script>

  <script>
```

```
    AOS.init();
  </script>
</body>


</html>
```

style.css

```
body::-webkit-scrollbar {
  display: none;
}
body,
html {
  background-color: #fff;
  font-family: "Playfair Display", serif;
  overflow-x: hidden !important;
  margin: 0px !important;
  padding: 0px !important;
}
* {
  text-decoration: none !important;
}
/* Navigation Bar */
.nav {
  position: fixed;
  z-index: 1000;
```

```
  top: 0;
  right: 0;
  left: 0;
  height: 80px;
  display: flex;
  flex-direction: row;
  justify-content: space-between;
  align-items: center;
  padding: 0 25px 0 25px;
  background-color: #fff;
  box-shadow: 0 19px 38px rgba(0, 0, 0, 0.1);
  border-bottom-left-radius: 10px;
  border-bottom-right-radius: 10px;
}
.nav .links a {
  margin-right: 25px;
  font-size: 16px;
  font-weight: 600;
  color: #000;
}
.nav .links .mainLink {
  color: #e8501b;
}


.nav .links a:hover {
```

```
  color: #007bff;
}
.nav .links .btn1 {
  padding: 8px 34px;
  margin-left: 10px 0px 10px 0px;
  display: inline-block;
  padding: 10.5px 36px;
  font-size: 14px;
  color: #000;
  -o-transition: all 0.4s ease-in-out;
  -webkit-transition: all 0.4s ease-in-out;
  transition: all 0.4s ease-in-out;
  text-transform: capitalize;
  border: 1px solid #e4e6ea;
  font-family: "Playfair Display", serif;
}

.nav .links .btn1:hover {
  color: #fff;
  border-radius: 45px;
  background-color: #007bff;
}

.nav .user-pic {
  width: 40px;
```

```
  border-radius: 50%;
  cursor: pointer;
  margin-left: 30px;
}
/* Landing CSS */
.landing {
  display: flex;
  flex-direction: row;
  justify-content: space-between;
  align-items: center;
  padding: 0 10vw 0 10vw;
  height: 90vh;
}
.landingText h1 {
  font-size: 4vw;
  margin: 0 !important;
}
.landingText h3 {
  margin: 6px !important;
  font-size: 15px;
  line-height: 1.8;
  color: #777777;
  font-family: "Playfair Display", serif;
  padding-right: 20px;
}
```

```css
.landingText .btn2 {
  width: 120px;
  margin-top: 30px;
  padding: 14px 20px 12px 20px;
  background-color: #007bff;
  border-radius: 45px;
  text-align: center;
}
.landingText .btn2 a {
  font-size: 1.2vw;
  color: #fff;
}
.landingImage img {
  width: 42vw;
}

/*Services Css*/
.about {
  height: 600px;
  padding: 30px 50px 30px 50px;
  display: flex;
  flex-direction: row;
  justify-content: space-evenly;
  align-items: center;
}
```

```css
.aboutText {
  position: relative;
  padding: 0 50px;
  height: inherit;
}
.aboutText h1 {
  position: relative;
  left: 110px;
}
.aboutText img {
  width: 42vw;
  position: absolute;
  top: 50px;
}
.aboutList {
  width: 50%;
}
ol {
  list-style-type: none;
  color: #e0501b;
}
ol li {
  font-size: 34px;
  position: relative;
  margin-bottom: 20px;
```

```
  border-bottom: 1px solid #ebebeb;
}
li p {
  font-size: 16px;
  color: #000;
  padding-left: 60px;
  line-height: 30px;
  opacity: 0.6;
}
li span {
  position: absolute;
  line-height: 25px;
  font-weight: 600;
}

/*Info Section*/
.infoSection {
  height: 600px;
}
.infoHeader {
  text-align: center;
  margin-bottom: 40px;
}
.infoCards {
  display: flex;
```

```
  flex-direction: row;
  justify-content: space-around;
  align-items: center;
  padding: 40px 0 40px 0;
}
.infoCards .card {
  position: relative;
  height: 360px;
  width: 360px;
  background: #fff;
  box-shadow: 0 10px 22px rgba(0, 0, 0, 0.9);
}
.infoCards .one .cardoneImg {
  width: 150px;
  position: absolute;
  top: -50px;
  right: -50px;
}
.infoCards .two .cardtwoImg {
  width: 150px;
  position: absolute;
  top: -50px;
  right: -50px;
}
.infoCards .three .cardthreeImg {
```

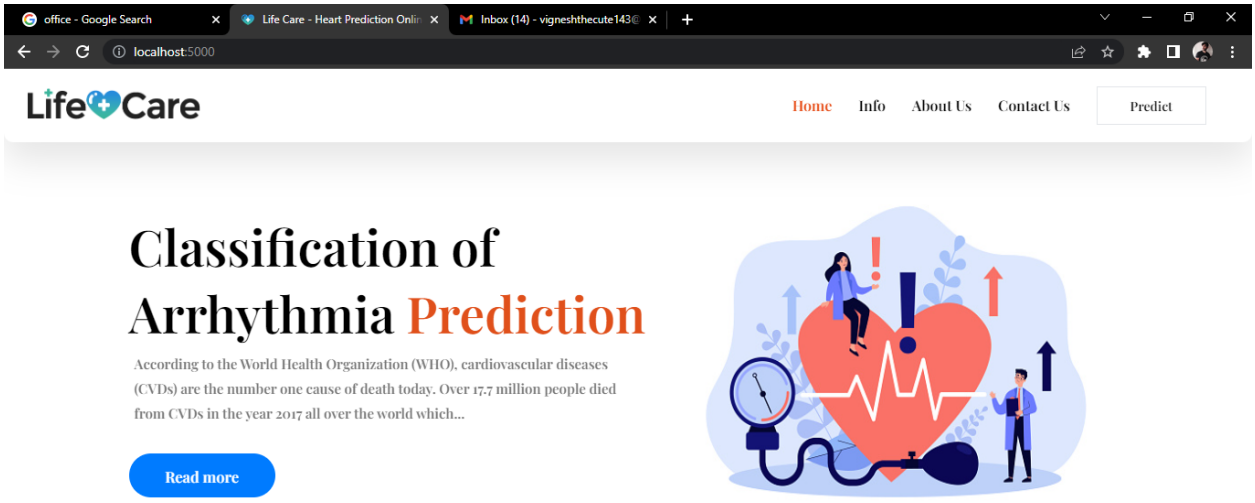
```
  width: 150px;
  position: absolute;
  top: -50px;
  right: -30px;
}
.cardbgone {
  height: 150px;
  border-color: #fff;
}
.cardbgtwo {
  height: 150px;
  background-color: #fff;
}
.cardbgthree {
  height: 150px;
  background-color: #fff;
}
.cardContent {
  padding: 0 20px;
}
.cardContent p {
  line-height: 30px;
  opacity: 0.6;
}
.cardContent .cardBtn {
```

```
  position: absolute;
  right: 20px;
  padding: 10px;
  background-color: #ededed;
  width: 25px;
  height: 20px;
  border-radius: 6px;
  display: flex;
  justify-content: center;
  align-items: center;
  transition: all ease-in-out 0.2s;
}
.cardContent .cardBtn:hover {
  border-color: #2f8be0;
}
.cardContent .cardBtn .cardIcon {
  position: relative;
  top: 0px;
  left: 0px;
  width: 16px;
}

/*Banner Css*/
.banner {
  height: 400px;
```

```
  background-color: #2f8be0;
  display: flex;
  flex-direction: row;
  padding: 50px;
  justify-content: space-evenly;
  align-items: center;
}
.bannerText h1 {
  font-size: 3vw;
  color: #000;
  font-weight: 600;
}
.bannerText img {
  width: 10vw;
  margin-right: 20px;
}
.bannerImg img {
  width: 20vw;
}
/*Footer Css*/
.footer {
  height: 100px;
  display: flex;
  flex-direction: column;
  align-items: center;
```

```
  padding-bottom: 20px;
}
.footerlinks a {
  margin: 20px;
  font-size: 16px;
  font-weight: 600;
  color: #000;
}
.footer .mainLink {
  color: #e0501b;
}
.footer a:hover {
  color: #007bff;
}
```

Output


office - Google Search
Life Care - Heart Prediction Onlin
Inbox (14) - vigneshthecute143@
localhost:5000
LifeCare
Home
Info
About Us
Contact Us
Predict
Classification of Arrhythmia Prediction
According to the World Health Organization (WHO), cardiovascular diseases (CVDs) are the number one cause of death today. Over 17.7 million people died from CVDs in the year 2017 all over the world which...
Read more

Info.html

```
<!DOCTYPE html>

<html lang="en">



<head>

    <meta charset="UTF-8" />

    <meta http-equiv="X-UA-Compatible" content="IE=edge" />

    <meta name="viewport" content="width=device-width, initial-scale=1.0"
/>

    <title>Life Care - About Classification of Arrhythmia</title>

    <link rel="shortcut icon" href="{{url_for('static',
filename='images/fevicon.png' )}}" type="image/x-icon">

    <link rel="stylesheet"
href="https://cdnjs.cloudflare.com/ajax/libs/aos/2.3.1/aos.css" />

    <link
href="https://fonts.googleapis.com/css2?family=Playfair+Display:wght@600&d
isplay=swap" rel="stylesheet" />

    <link rel="stylesheet" href="{{url_for('static',
filename='css/style.css' )}}" />

    <script src="https://kit.fontawesome.com/64d58efce2.js"
crossorigin="anonymous">

    </script>

    <style>

        .banner {

            margin: 60px;

            width: auto;

            height: 300px;
```

```
        /* Setup */
        background-color: #fff;
        box-shadow: rgba(0, 0, 0, 0.15) 2.4px 2.4px 3.2px;
        display: flex;
        flex-direction: row;
        padding: 50px;
    }

    .bannerText h1 {
        font-size: 3vw;
        color: #007bff;
        font-weight: 600;
    }

    .bannerText p {
        text-indent: 50px;
        color: #777777;
        font-size: 1.2vw;
        font-weight: normal
    }

    .bannerText img {
        width: 10vw;
        margin-right: 20px;
    }
```

```
        .bannerImg img {
            margin-left: 90px;
            width: 350px;
        }
    </style>
</head>

<body>
    <div class="wrapper">
        <!--Navigation Bar-->
        <div class="nav">
            <div class="logo">
                <a href="/"><img src="static/images/logo.png" alt="Website
Title" style="width:190px" /></a>
            </div>
            <div class="links">
                <a href="/home">Home</a>
                <a href="/info" class="mainLink">info</a>
                <a href="/about">About Us</a>
                <a href="/contact">Contact Us</a>
                <a href="/upload" class="btn1">Predict</a>
            </div>
        </div>
        <!--Landing Page-->
```

```
        <div class="landing">

            <div class="landingText" data-aos="fade-up"
data-aous-duration="1000">

                <h1>

                    Classification of Arrhythmia

                    <span style="color: #e0501b; font-size:
4vw">Prediction</span>

                </h1>

                <h3>

                    According to the World Health Organization (WHO),
cardiovascular diseases (CVDs) are the number one

                    cause of death

                    today. Over 17.7 million people died from CVDs in the
year 2017 all over the world which is about

                    31% of all deaths, and

                    over 75% of these deaths occur in low and
middle-income countries. Arrhythmia is a representative

                    type of CVD that

                    refers to any irregular change from the normal heart
rhythms. There are several types of arrhythmia

                    including atrial

                    fibrillation, premature contraction, ventricular
fibrillation, and tachycardia. Although a single

                    arrhythmia heartbeat

                    may not have a serious impact on life, continuous
arrhythmia beats can result in fatal

                    circumstances.

                </h3>
```

```
            </div>

            <div class="landingImage" data-aos="fade-down"
data-aous-duration="2000">

                <img src="static/images/banner_img.jpg" alt="bannerImg"
style="width: 500px; height:360px" />

            </div>

        </div>

        <div class="banner">

            <div class="bannerText" data-aos="fade-right"
data-aous-duration="1000">

                <h1>

                    Left Bundle Branch

                </h1>

                <p>A delay blockage of electrical impulses

                    to the left of the heart. Left bundle brach block
sometimes

                    makes it harder for the heart to pump

                    blood efficiently through the circulatory

                    system.</p>

                <p>Most people don't have symptoms. If

                    symtoms occur, they inlcude fainting or

                    a slow heart rate.</p>

                <p>If there's an underlying condition, such

                    as heart disease, that condition needs

                    treatment. In patients with heart failure,

                    a pacemaker can also relieve symptoms as
```

```
                    well as prevent death.</p>

            </div>

            <div class="bannerImg" data-aos="fade-up"
data-aous-duration="1000">

                <img src="static/images/LBB.svg" alt="" />

            </div>

        </div>

        <div class="banner">

            <div class="bannerText" data-aos="fade-right"
data-aous-duration="1000">

                <h1>

                    Normal

                </h1>

                <p>Note that the heart is beating

                    in a regular sinus rhythm

                    between 60-100 beats per

                    minute (specifically 82 bpm).</p>

                <p>All the important intervals

                    on this recording are within

                    normal ranges.</p>

                <p>The normal ECG

                    patterns seen in children

                    differ considerably from those

                    in adults.</p>

            </div>
```

```
            <div class="bannerImg" data-aos="fade-up"
data-aous-duration="1000">
                <img src="static/images/normal.svg" alt="" />
            </div>
        </div>
        <div class="banner">
            <div class="bannerText" data-aos="fade-right"
data-aous-duration="1000">
                <h1>
                    Premature Atrial Contraction
                </h1>
                <p>usually, premature artial contraction have
                    no clear cause and no health risks. In most
                    cases, premature artrial contractions aren't a
                    sign of heart disease and just happen
                    naturally.</p>
                <p>But some people who have PACs turn out to
                    have related heart conditions, such as
                    Cardiomyopathy (a weakend heart muscle)
                    Caronary heart disease (fatty deposits in you blood
vessels)</p>
            </div>
            <div class="bannerImg" data-aos="fade-up"
data-aous-duration="1000">
                <img src="static/images/PAC.jpg" alt="" />
            </div>
```

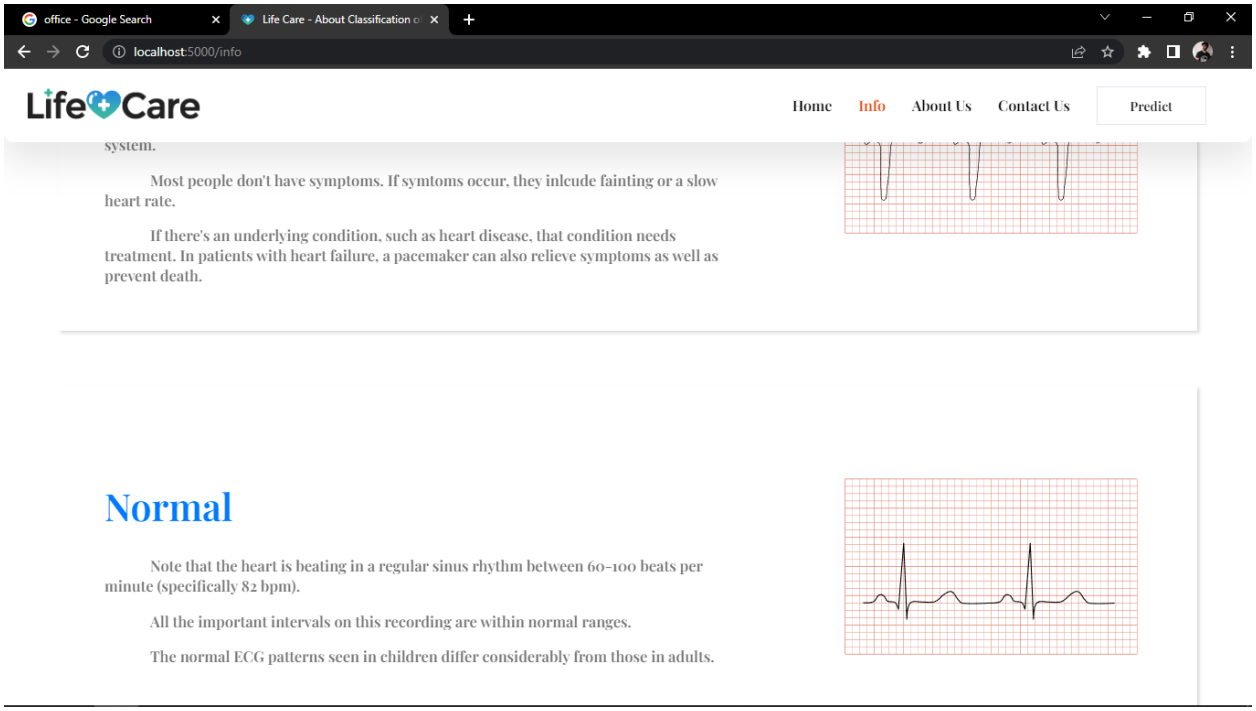
```
        </div>
        <div class="banner">
            <div class="bannerText" data-aos="fade-right"
data-aous-duration="1000">
                <h1>
                    Premature Ventricular Contractions
                </h1>
                <p>Extra, abnorma heartbeats that begininone of the
                    Heart's two lower chambers.</p>
                <p>Premature ventricular contractions (PVCs) occur
                    in most people at some point. Causes may include
certain
                    medication, alcohol, some illegal drugs, caffeine,
                    tobacco, excercise or anxiety.</p>
                <p>
                    PVCs often cause no symtoms. When symptoms do
                    occur, they feel like a flip-flop or skipped-beat
                    sensation in the chest.
                </p>
                <p>Most people with isolated PVCs and an otherwise
                    normal heart don't need treatment. PVCs occurring
                    continuously serious cardiac than 30 seconds is a
                    potentially serious cardiac condition known as
                    ventriclular tachycardia.</p>
            </div>
```

```
            <div class="bannerImg" data-aos="fade-up"
data-aous-duration="1000">
                <img src="static/images/PVC.jpg" alt="" />
            </div>
        </div>
        <div class="banner">
            <div class="bannerText" data-aos="fade-right"
data-aous-duration="1000">
                <h1>
                    Right Bundle Branch
                </h1>
                <p>Right bundle branch block is associated with
                    structural changes from strech or ischemia to
                    the myocardium. It can also occur
                    iatorgenically from certain common cardiac
                    precedures, such as right heart catheterization.</p>
                <p>Although there is no significant association
                    with cardiovascular risk factors, the presence
                    with cardiovascular risk factors, the presence
                    of a right bundle branch block is a predictor of
                    mortality in myocardial infarction, heart
                    failure, and certain heart blocks.</p>
                <p>In asymptomatic patients, isolated right bundle
                    brach block typically does not need further
                    evaluation.</p>
            </div>
```

```
            <div class="bannerImg" data-aos="fade-up"
data-aous-duration="1000">
                <img src="static/images/RBB.svg" alt="" />
            </div>
        </div>
        <div class="banner">
            <div class="bannerText" data-aos="fade-right"
data-aous-duration="1000">
                <h1>
                    Ventricular Fibrillation
                </h1>
                <p>A life-threatening heart rhythm that results in a
                    rapid, inadeuate heartbeat.</p>
                <p>Ventricular fibrillation (VF) is a rapid,
                    Life-threatening heart rhythm starting in the bottom
                    chambers of the heart. It can be triggered by a heart
attack.</p>
                <p>Because the heart doesn't pump adequately during
                    ventricular fibrillation, sustained VF can cause
                    low blood pressure, losso f consciousness of
death.</p>
                <p>Emergency treatment includes immediate
                    defibrillation with a n automated external
                    defibrillator (AED) and cardiopulmonary
                    resuscitation(CPR). Long-term therapy includes
                    implantable defibrillators and medcations to
```

```
                    prevent recurrence.</p>

            </div>

            <div class="bannerImg" data-aos="fade-up"
data-aous-duration="1000">

                <img src="static/images/VF.png" alt="" />

            </div>

        </div>

        <div class="footer">

            <h1>LifeCare</h1>

            <div class="footerlinks">

                <a href="/home">Home</a>

                <a href="/info" class="mainLink">Info</a>

                <a href="/about">About Us</a>

                <a href="/conduct">Contact Us</a>

            </div>

        </div>

    </div>

    <script
src="https://cdnjs.cloudflare.com/ajax/libs/aos/2.3.1/aos.js"></script>

    <script>

        AOS.init();

    </script>

</body>


</html>
```

Output



about.html

```
<!DOCTYPE html>

<html lang="en">



<head>

    <meta charset="UTF-8">

    <meta http-equiv="X-UA-Compatible" content="IE=edge">

    <meta name="viewport" content="width=device-width, initial-scale=1.0">

    <link rel="shortcut icon" href="{{url_for('static',
filename='images/fevicon.png' )}}" type="image/x-icon">
```

```
    <title>Life Care - About Us</title>

    <link rel="stylesheet" href="{{url_for('static',
filename='css/about.css')}}">

    <link rel="stylesheet" href="{{url_for('static',
filename='css/style.css')}}">

    <link rel="stylesheet"
href="https://cdnjs.cloudflare.com/ajax/libs/aos/2.3.1/aos.css" />

    <link
href="https://fonts.googleapis.com/css2?family=Playfair+Display:wght@600&d
isplay=swap" rel="stylesheet" />

    <link
href="https://cdnjs.cloudflare.com/ajax/libs/font-awesome/5.10.0/css/all.m
in.css" rel="stylesheet">

</head>

<style>

    .footer {

        margin-bottom: 20px;

    }


    h1 {

        margin: 21.44px 0px;

    }

</style>


<body>

    <div class="wrapper">

        <!--Navigation Bar-->

        <div class="nav">
```

```
            <div class="logo">
                <a href="/"><img src="static/images/logo.png" alt="Website
Title" style="width:190px" /></a>
            </div>
            <div class="links">
                <a href="/">Home</a>
                <a href="/info">Info</a>
                <a href="/about" class="mainLink">About Us</a>
                <a href="/contact">Contact Us</a>
                <a href="/upload" class="btn1">Predict</a>
            </div>
        </div>
        <div class="landing">
            <div class="landingText" data-aos="fade-up"
data-aous-duration="1000">
                <h1>
                    We are a team of
                    <span style="color: #e0501b; font-size: 4vw">Arrthymia
Prediction</span>
                </h1>
                <h3>
                    In this project, we build an effective
electrocardiogram (ECG) arrhythmia classification method
                    using a convolutional
                    neural network (CNN), in which we classify ECG into
seven categories, one being normal and the other
                    six being different
```

```
                    types of arrhythmia using deep two-dimensional CNN
with grayscale ECG images. We are creating a web

                    application where

                    the user selects the image which is to be classified.
The image is fed into the model that is

                    trained and the cited

                    class will be displayed on the webpage.

                </h3>

            </div>

            <div class="landingImage" data-aos="fade-down"
data-aous-duration="2000">

                <img src="static/images/about_us.png" alt="aboutImg"
style="width: 450px; height:450px" />

            </div>

        </div>

        <div class="main">

            <div class="profile-card">

                <div class="img">

                    <img src="static/images/profile_avatar.png">

                </div>

                <div class="caption">

                    <h3>Muthamizhan</h3>

                    <p>Back End Developer, Dl Engineer</p>

                    <div class="social-links">

                        <a href="#"><i class="fab fa-facebook"></i></a>

                        <a href="#"><i class="fab fa-instagram"></i></a>
```

```
                        <a href="#"><i class="fab fa-twitter"></i></a>
                    </div>
                </div>
            </div>
            <div class="profile-card">
                <div class="img">
                    <img src="static/images/profile_avatar.png">
                </div>
                <div class="caption">
                    <h3>Vignesh Champ</h3>
                    <p>Full Stack Developer, Web Designer, Deep Learning
Engineer</p>
                    <div class="social-links">
                        <a href="#"><i class="fab fa-facebook"></i></a>
                        <a
href="https://www.instagram.com/the_._._champ/"><i class="fab
fa-instagram"></i></a>
                        <a href="#"><i class="fab fa-twitter"></i></a>
                    </div>
                </div>
            </div>
            <div class="profile-card">
                <div class="img">
                    <img src="static/images/profile_avatar.png">
                </div>
                <div class="caption">
```

```
                <h3>Vetriselvan</h3>
                <p>Back End Developer</p>
                <div class="social-links">
                    <a href="#"><i class="fab fa-facebook"></i></a>
                    <a href="#"><i class="fab fa-instagram"></i></a>
                    <a href="#"><i class="fab fa-twitter"></i></a>
                </div>
            </div>
        </div>
        <div class="profile-card">
            <div class="img">
                <img src="static/images/profile_avatar.png">
            </div>
            <div class="caption">
                <h3>Bharathidasan</h3>
                <p>Front End Developer</p>
                <div class="social-links">
                    <a href="#"><i class="fab fa-facebook"></i></a>
                    <a href="#"><i class="fab fa-instagram"></i></a>
                    <a href="#"><i class="fab fa-twitter"></i></a>
                </div>
            </div>
        </div>
    </div>
    <div class="footer">
```

```
            <h1>LifeCare</h1>
            <div class="footerlinks">
                <a href="/home">Home</a>
                <a href="/info">Info</a>
                <a href="/about">About Us</a>
                <a href="/contact">Contact Us</a>
            </div>
        </div>
    </div>

    </div>
    <script
src="https://cdnjs.cloudflare.com/ajax/libs/aos/2.3.1/aos.js"></script>
    <script>
        AOS.init();
    </script>
</body>

</html>
```

about.css

```
* {
  text-decoration: none !important;
  margin: 0;
  padding: 0;
```

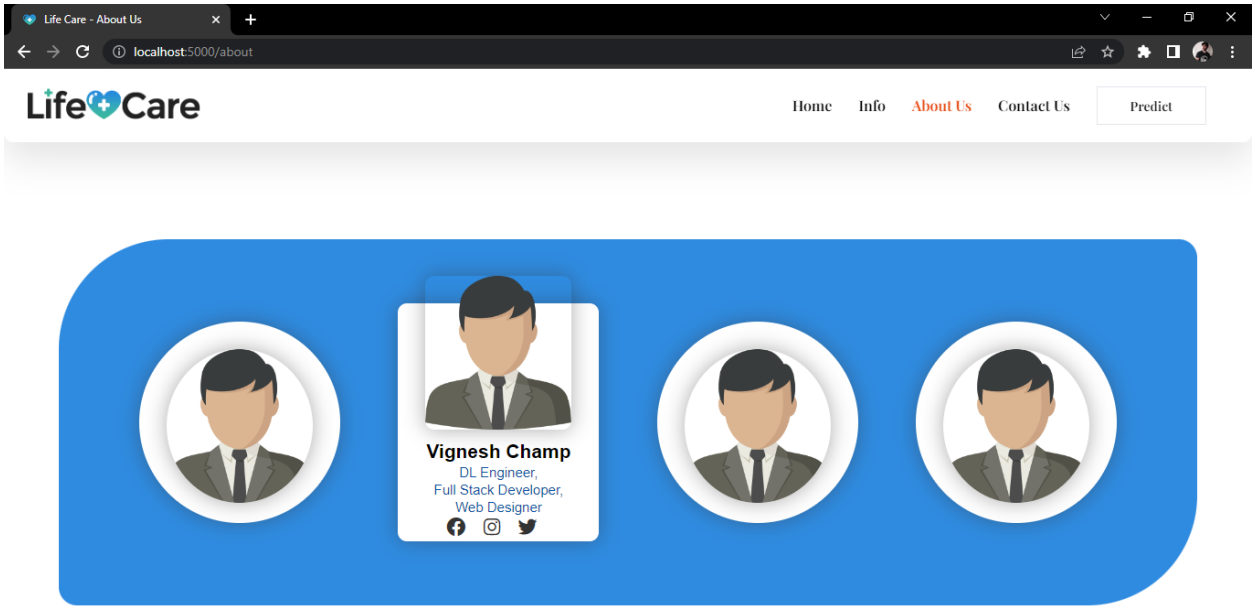
```
  box-sizing: border-box;
}

@font-face {
  font-family: Exo;
  src: url(./fonts/Exo2.0-Medium.otf);
}

.main {
  height: 400px;
  margin: 60px;
  background-color: #2f8be0;
  display: flex;
  flex-direction: row;
  padding: 50px;
  justify-content: space-evenly;
  align-items: center;
  border-radius: 120px 20px;
}

.profile-card {
  position: relative;
  font-family: sans-serif;
  width: 220px;
  height: 220px;
```

```
  background: #fff;
  padding: 30px;
  border-radius: 50%;
  box-shadow: 0 0 22px #3336;
  transition: 0.6s;
  margin: 0 25px;
}

.profile-card:hover {
  border-radius: 10px;
  height: 260px;
}

.profile-card .img {
  position: relative;
  width: 100%;
  height: 100%;
  transition: 0.6s;
  z-index: 99;
}

.profile-card:hover .img {
  transform: translateY(-60px);
}
```

```css
.img img {
  width: 100%;
  border-radius: 50%;
  box-shadow: 0 0 22px #3336;
  transition: 0.6s;
}

.profile-card:hover img {
  border-radius: 10px;
}

.caption {
  text-align: center;
  transform: translateY(-80px);
  opacity: 0;
  transition: 0.6s;
}

.profile-card:hover .caption {
  opacity: 1;
}

.caption h3 {
  font-size: 21px;
  font-family: sans-serif;
```

```css
}


.caption p {
  font-size: 15px;
  color: #0c52a1;
  font-family: sans-serif;
  margin: 2px 0 9px 0;
}


.caption .social-links a {
  color: #333;
  margin-right: 15px;
  font-size: 21px;
  transition: 0.6s;
}


.social-links a:hover {
  color: #0c52a1;
}
```

Output



LifeCare

contact.html

```
<!DOCTYPE html>

<html lang="en">



<head>

    <meta charset="UTF-8">

    <meta http-equiv="X-UA-Compatible" content="IE=edge">

    <meta name="viewport" content="width=device-width, initial-scale=1.0">

    <link rel="shortcut icon" href="{{url_for('static',
filename='images/fevicon.png' )}}" type="image/x-icon">

    <link rel="stylesheet"
href="https://cdnjs.cloudflare.com/ajax/libs/aos/2.3.1/aos.css" />
```

```
    <link rel="stylesheet"
href="https://cdnjs.cloudflare.com/ajax/libs/font-awesome/5.15.3/css/all.m
in.css" />

    <link
href="https://fonts.googleapis.com/css2?family=Playfair+Display:wght@600&d
isplay=swap" rel="stylesheet" />

    <link rel="stylesheet" href="{{url_for('static',
filename='css/contact.css' )}}" />

    <link rel="stylesheet" href="{{url_for('static',
filename='css/style.css' )}}" />

    <title>Life Care - Contact US</title>

</head>


<body>

    <div class="wrapper">

        <div class="nav">

            <div class="logo">

                <a href="/">

                    <img src="static\images\logo.png" style="width:190px"
/>


                </a>

            </div>

            <div class="links">

                <a href="/home" class="mainLink">Home</a>

                <a href="/info">Info</a>

                <a href="/about">About Us</a>

                <a href="/contact">Contact Us</a>

                <a href="/upload" class="btn1">Predict</a>
```

```
            </div>

        </div>

        <div class="container" data-aos="fade-down"
data-aous-duration="1000">

            <div class="image" data-aos="fade-right"
data-aous-duration="6000">

                <img src="static/images/contact.png" alt="">

            </div>

            <div class="form-area">

                <h2>Contact US</h2>

                <form action="{{url_for('send_message')}}" method="post">

                    <input type="text" name="name" placeholder="Full
Name">

                    <input type="email" name="email" placeholder="Email">

                    <input type="text" name="subject"
placeholder="Subject">

                    <textarea cols="30" name="message" rows="3"
placeholder="Your Message"></textarea>

                    <button type="submit">Send Message</button>

                </form>

            </div>

        </div>

    </div>

    <script
src="https://cdnjs.cloudflare.com/ajax/libs/aos/2.3.1/aos.js"></script>

    <script>

        AOS.init();
```

```
    </script>

</body>



</html>
```

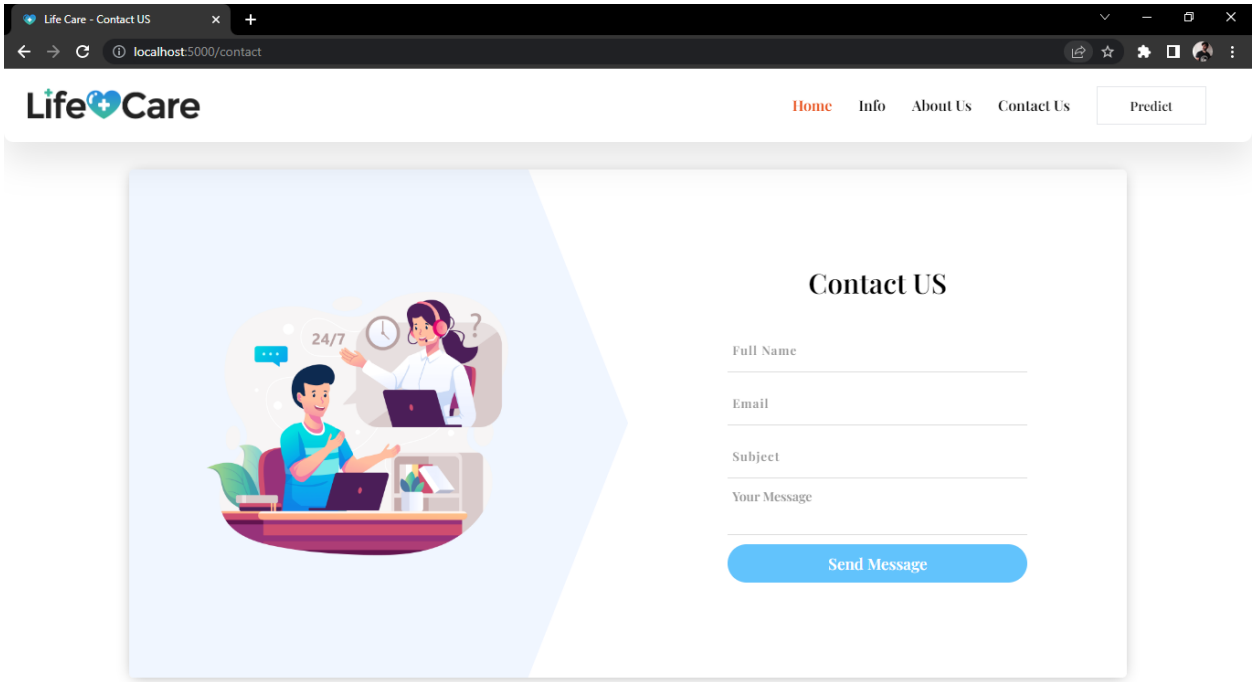
contact.css

```
<!DOCTYPE html>

<html lang="en">



<head>

    <meta charset="UTF-8">

    <meta http-equiv="X-UA-Compatible" content="IE=edge">

    <meta name="viewport" content="width=device-width, initial-scale=1.0">

    <link rel="shortcut icon" href="{{url_for('static',
filename='images/fevicon.png' )}}" type="image/x-icon">

    <link rel="stylesheet"
href="https://cdnjs.cloudflare.com/ajax/libs/aos/2.3.1/aos.css" />

    <link rel="stylesheet"
href="https://cdnjs.cloudflare.com/ajax/libs/font-awesome/5.15.3/css/all.m
in.css" />

    <link
href="https://fonts.googleapis.com/css2?family=Playfair+Display:wght@600&d
isplay=swap" rel="stylesheet" />

    <link rel="stylesheet" href="{{url_for('static',
filename='css/contact.css' )}}" />

    <link rel="stylesheet" href="{{url_for('static',
filename='css/style.css' )}}" />

    <title>Life Care - Contact US</title>
```

```
</head>


<body>
    <div class="wrapper">
        <div class="nav">
            <div class="logo">
                <a href="/">
                    <img src="static\images\logo.png" style="width:190px"
/>
                </a>
            </div>
            <div class="links">
                <a href="/home" class="mainLink">Home</a>
                <a href="/info">Info</a>
                <a href="/about">About Us</a>
                <a href="/contact">Contact Us</a>
                <a href="/upload" class="btn1">Predict</a>
            </div>
        </div>
        <div class="container" data-aos="fade-down"
data-aous-duration="1000">
            <div class="image" data-aos="fade-right"
data-aous-duration="6000">
                <img src="static/images/contact.png" alt="">
            </div>
            <div class="form-area">
```

```
                <h2>Contact US</h2>

                <form action="{{url_for('send_message')}}" method="post">

                    <input type="text" name="name" placeholder="Full
Name">

                    <input type="email" name="email" placeholder="Email">

                    <input type="text" name="subject"
placeholder="Subject">

                    <textarea cols="30" name="message" rows="3"
placeholder="Your Message"></textarea>

                    <button type="submit">Send Message</button>

                </form>

            </div>

        </div>

    </div>

    <script
src="https://cdnjs.cloudflare.com/ajax/libs/aos/2.3.1/aos.js"></script>

    <script>

        AOS.init();

    </script>

</body>



</html>
```

Output



predict_base.html

```
<!DOCTYPE html>

<html lang="en">



<head>

    <meta charset="UTF-8" />

    <meta http-equiv="X-UA-Compatible" content="IE=edge" />

    <meta name="viewport" content="width=device-width, initial-scale=1.0"
/>

    <title>Life Care - Heart Prediction Online</title>

    <link rel="shortcut icon" href="{{url_for('static',
filename='images/fevicon.png' )}}" type="image/x-icon">

    <link rel="stylesheet"
href="https://cdnjs.cloudflare.com/ajax/libs/aos/2.3.1/aos.css" />
```

```
    <link
href="https://fonts.googleapis.com/css2?family=Playfair+Display:wght@600&d
isplay=swap" rel="stylesheet" />

    <script
src="https://cdn.bootcss.com/popper.js/1.12.9/umd/popper.min.js"></script>

    <script
src="https://cdn.bootcss.com/jquery/3.3.1/jquery.min.js"></script>

    <script
src="https://cdn.bootcss.com/bootstrap/4.0.0/js/bootstrap.min.js"></script
>

    <link href="{{ url_for('static', filename='css/main.css') }}"
rel="stylesheet">

    <link rel="stylesheet" href="{{url_for('static',
filename='css/style.css' )}}" />

    <script src="https://kit.fontawesome.com/64d58efce2.js"
crossorigin="anonymous">

    </script>

</head>


<body>

    <div class="wrapper">

        <!--Navigation Bar-->

        <div class="nav">

            <div class="logo">

                <a href="/">

                    <img src="static\images\logo.png" style="width:190px"
/>

                </a>

            </div>
```

```
            <div class="links">
                <a href="/">Home</a>
                <a href="/info">Info</a>
                <a href="/about">About Us</a>
                <a href="/contact">Contact Us</a>
                <a href="/upload" class="btn1">Predict</a>
            </div>
        </div>
        <!--Landing Page-->
        <div class="landing">
            <div class="landingText" data-aos="fade-up"
data-aous-duration="10000">
                <h1>
                    Classification of Arrhythmia
                    <span style="color: #e0501b; font-size:
4vw">Prediction</span>
                </h1>
                <h3>
                    According to the World Health Organization (WHO),
cardiovascular diseases (CVDs) are the number one
                    cause of
                    death today. Over 17.7 million people died from CVDs
in the
                    year 2017 all over the world which...
                </h3>
```

```
                <div class="btn2"><a href="/info">Read more</a>

                </div>

            </div>

            <div class="landingImage" data-aos="fade-down"
data-aous-duration="2000">

                <img src="static/images/banner_img.jpg" alt="bannerImg"
style="width: 500px; height:360px" />

            </div>

        </div>



        <div class="about">

            <div class="aboutText" data-aos="fade-up"
data-aous-duration="1000">

                {% block content %}{% endblock %}

            </div>

        </div>



        <div class="footer">

            <h1>LifeCare</h1>

            <div class="footerlinks">

                <a href="/home">Home</a>

                <a href="/info">Info</a>

                <a href="/about">About Us</a>

                <a href="/contact">Contact Us</a>

            </div>

        </div>
```

```
    </div>


    <script
src="https://cdnjs.cloudflare.com/ajax/libs/aos/2.3.1/aos.js"></script>
    <script>
        AOS.init();
    </script>
</body>
<footer>
    <script src="{{ url_for('static', filename='js/main.js') }}"
type="text/javascript"></script>
</footer>


</html>
```

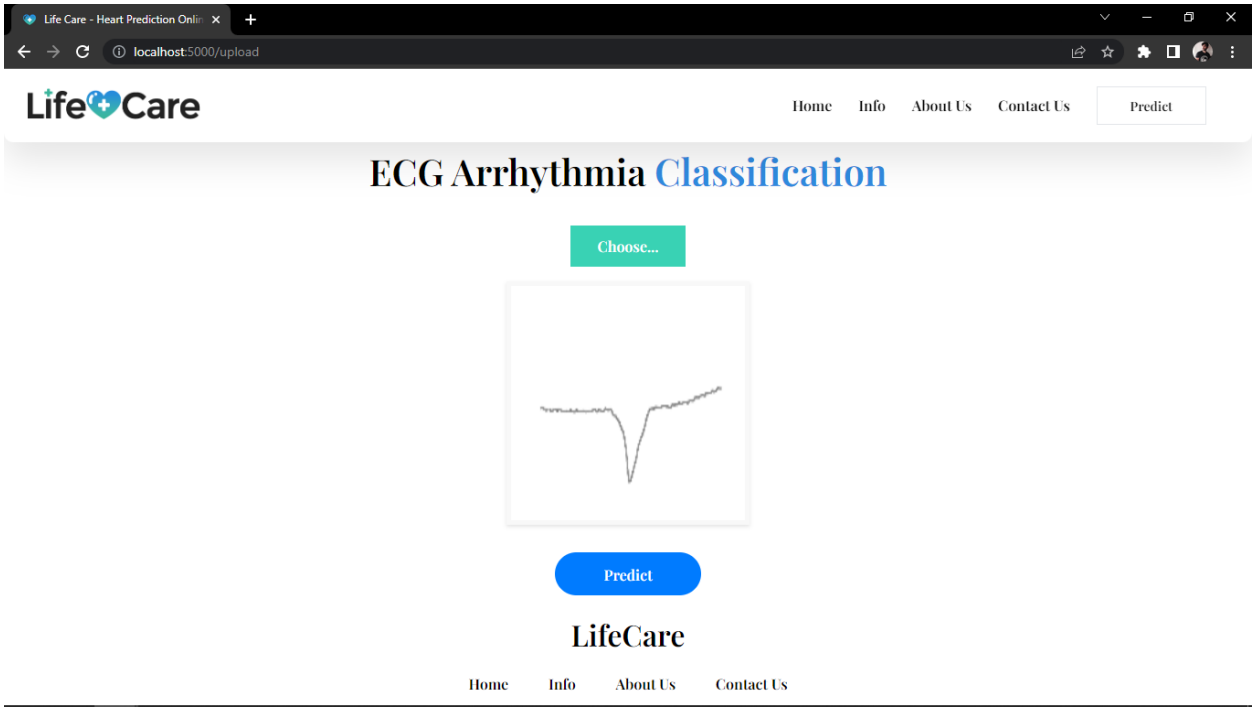
predict.html

```
{% extends "predict_base.html" %} {% block content %}


<center>
    <h2 style="font-size: 40px;">
        ECG Arrhythmia
        <span style="color: #2f8be0; font-size: 3vw">Classification</span>
    </h2>
</center>
```

```
<div>
    <form id="upload-file" method="post" enctype="multipart/form-data">
        <center> <label for="imageUpload" class="upload-label">
                Choose...
            </label>
            <input type="file" name="file" id="imageUpload" accept=".png,
.jpg, .jpeg">
        </center>
    </form>

    <center>
        <div class="image-section" style="display:none;">
            <div class="img-preview">
                <div id="imagePreview">
                </div>
            </div>
        </div>
    </center>
</div>
<center>
    <div class="btn3" id="btn-predict"
        style="padding: 8px 34px; width: 120px; margin-top: 30px; padding:
14px 20px 12px 20px; background-color: #007bff; border-radius: 45px;
text-align: center; color: #fff; cursor: pointer;">
        Predict</div>
    <div class="loader" style="display:none;"></div>
```

```
</center>


<h3 style="color:Black" id="result">

    <span> </span>

</h3>


</div>


</div>




{% endblock %}
```

Output



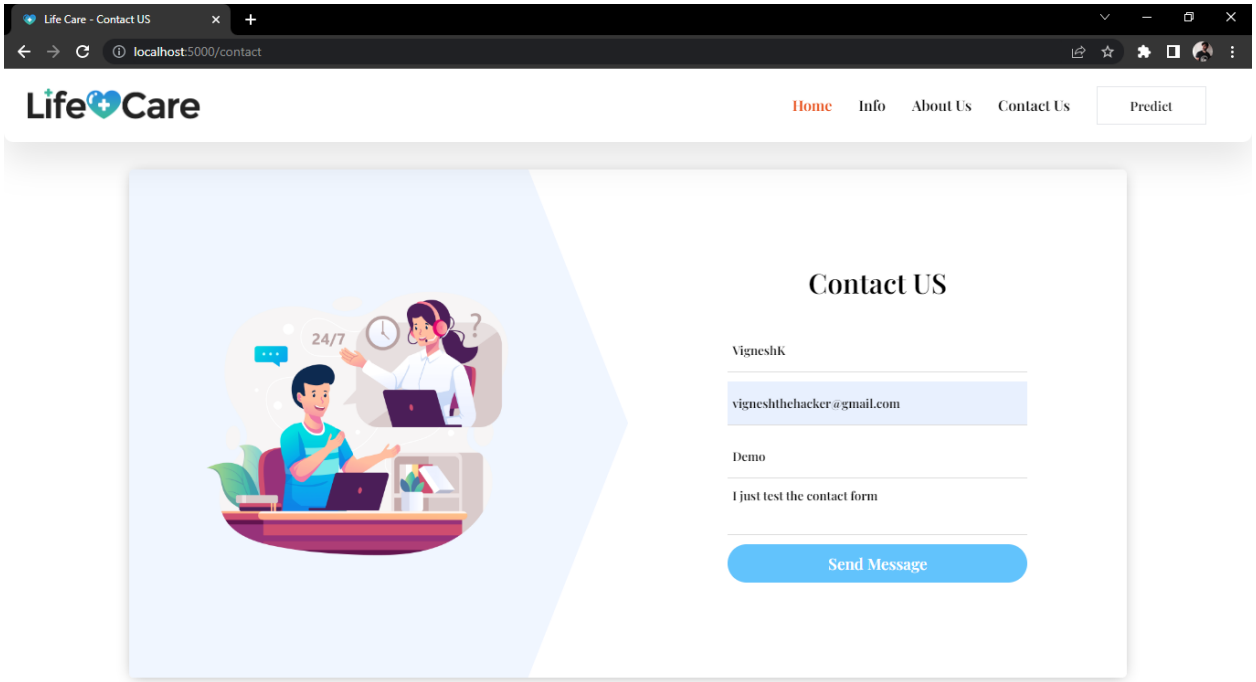
Coding (contact)

```
from flask import Flask,render_template,request

from flask_mail import Mail,Message



app=Flask(__name__)#our flask app



app.config['MAIL_SERVER'] = 'smtp.gmail.com'

app.config['MAIL_PORT'] = 465

app.config['MAIL_USERNAME'] = 'teamarrhythmiaprediction@gmail.com'

app.config['MAIL_PASSWORD'] = 'wjolgozdhnafolyd'

app.config['MAIL_USE_TLS'] = False

app.config['MAIL_USE_SSL'] = True
```

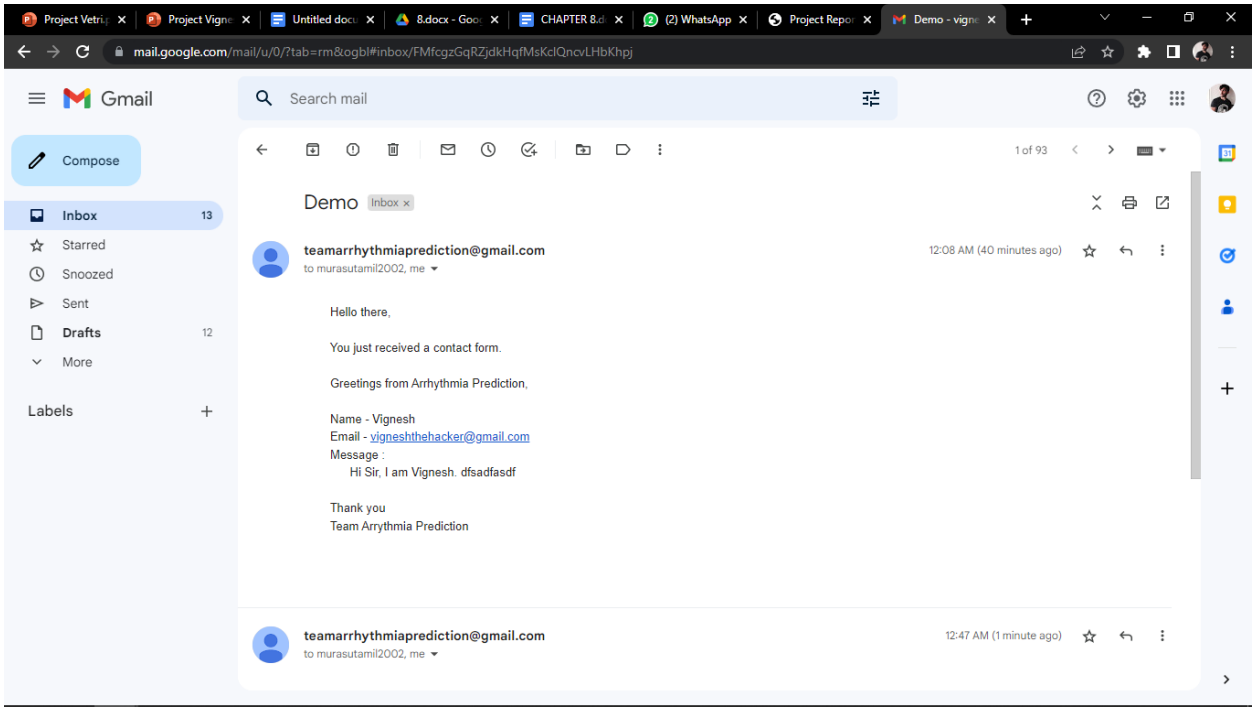
```
mail=Mail(app)
@app.route("/send_message", methods=['GET', 'POST'])
def send_message():
    if request.method=="POST":
        name = request.form['name']
        email = request.form['email']
        subject = request.form['subject']
        msg = request.form['message']
        message = Message(subject, sender=email,
recipients=['vigneshthecute143@gmail.com', 'murasutamil2002@gmail.com'])

        message.body="""
        Hello there,

        You just received a contact form.

        Greetings from Arrhythmia Prediction,

        Name - {}
        Email - {}
        Message :
              Hi Sir, I am {}. {}

        Thank you
```

```
        Team Arrythmia Prediction


        """.format(name,email,name,msg)


        mail.send(message)


        success = "Message Sent"


        return render_template("success.html",success=success)


if __name__=="__main__":
    app.run(debug=True)
```

Sample Output



Actual Output



Github Link

Project Demo Link