

PROJECT DEVELOPMENT PHASE SPRINT- III

| | |
|---------|----------------------------------------------------------------------------------------------------------|
| Team ID | PNT2022TMID03100 |
| Title | Project - Classification of Arrhythmia by Using Deep Learning with 2-D ECG Spectral Image Representation |

Description of USN and Screenshots:

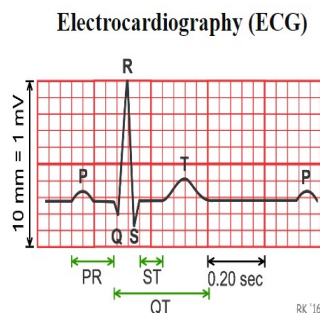
USN-5:

As a user, I can enter the webpage and view the homepage about the information about Electrocardiography (ECG) giving a clear perspective of the signals. I must also be able to comprehend all medical jargon related to Arrhythmias such as ECG, Coronary Heart Disease, Cardiomyopathy and its types.

Screenshot:



ECG Image Based Heartbeat Classification



An electrocardiogram (ECG) is a simple test that can be used to check your heart's rhythm and electrical activity. Sensors attached to the skin are used to detect the electrical signals produced by your heart each time it beats. These signals are recorded by a machine and are looked at by a doctor to see if they're unusual. An ECG may be requested by a heart specialist (cardiologist) or any doctor who thinks you might have a problem with your heart, including your GP. The test can be carried out by a specially trained healthcare professional at a hospital, a clinic or at your GP surgery. Despite having a similar name, an ECG isn't the same as an echocardiogram, which is a scan of the heart.

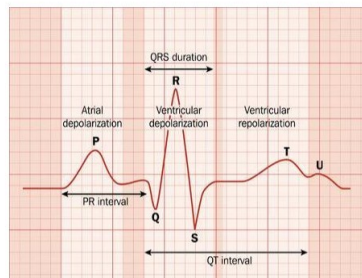
When is an ECG is used?

An ECG is often used alongside other tests to help diagnose and monitor conditions affecting the heart. It can be used to investigate symptoms of a possible heart problem, such as chest pain, palpitations (suddenly noticeable heartbeats), dizziness and shortness of breath. An ECG can help detect:

- Arrhythmias - Where the heart beats too slowly, too quickly, or irregularly.
- Coronary Heart Disease - Where the heart's blood supply is blocked or interrupted by a build-up of fatty substances.
- Heart Attacks - Where the supply of blood to the heart is suddenly blocked.
- Cardiomyopathy - Where the heart walls become thickened or enlarged.

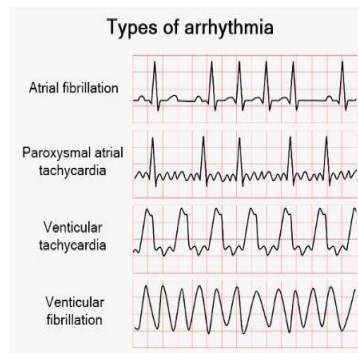
A series of ECGs can also be taken over time to monitor a person already diagnosed with a heart condition or taking medication known to potentially affect the heart.

Normal ECG



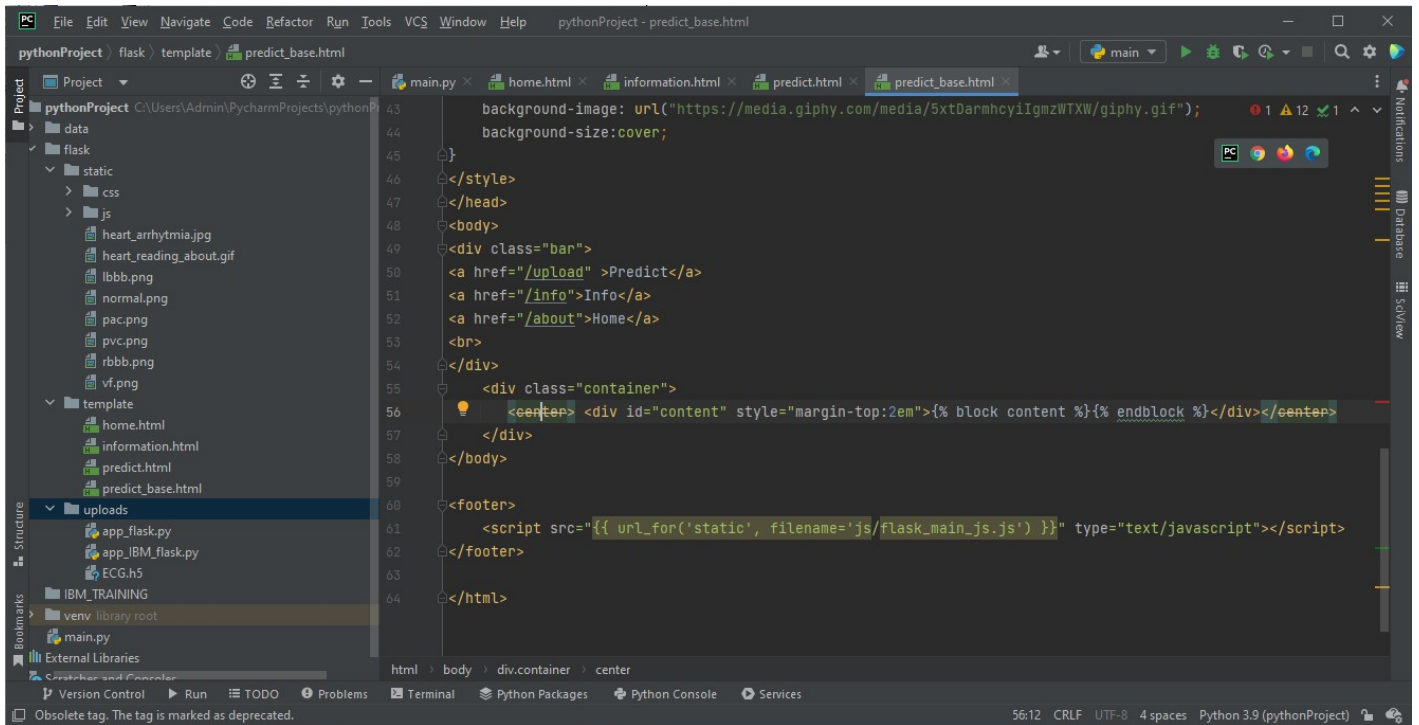
A normal ECG is illustrated above. Note that the heart is beating in a regular sinus rhythm between 60 - 100 beats per minute (specifically 82 bpm). All the important intervals on this recording are within normal ranges.

Abnormal ECG



Electrocardiographic abnormalities include first-degree heart block, right and left bundle branch block, premature atrial and ventricular contractions.

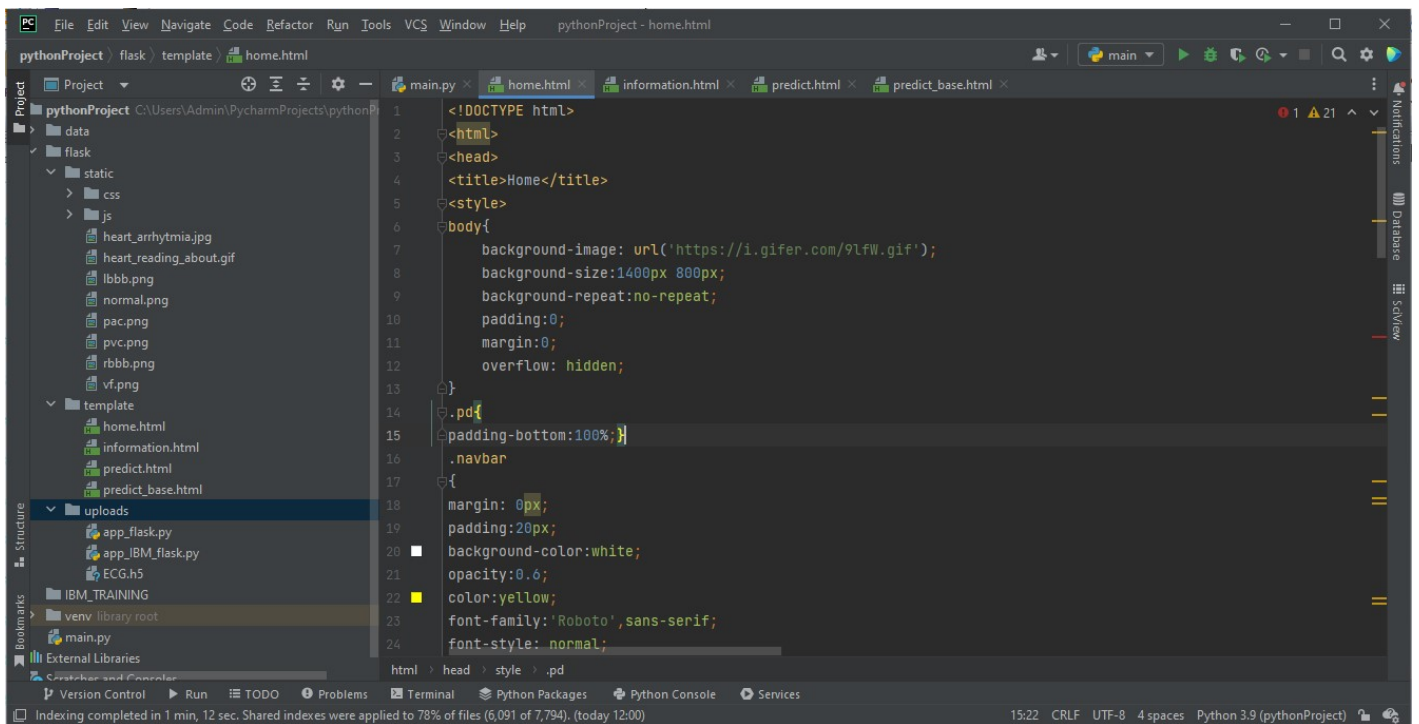
The HTML file used to build the app_flask.py page includes:



The screenshot shows the PyCharm IDE with the file `predict_base.html` open. The left sidebar displays the project structure, including a `template` folder containing `home.html`, `information.html`, `predict.html`, and `predict_base.html`. The main editor area shows the HTML code for `predict_base.html`, which includes a background image, a navigation bar with links to `/upload`, `/info`, and `/about`, a main content container, and a footer with a JavaScript script. The status bar at the bottom indicates the file is using UTF-8 encoding, 4 spaces for indentation, and Python 3.9.

```
43 background-image: url("https://media.giphy.com/media/5xtDarmhcyIgmzWTXW/giphy.gif");
44 background-size: cover;
45
46 </style>
47 </head>
48 <body>
49 <div class="bar">
50 <a href="/upload" >Predict</a>
51 <a href="/info">Info</a>
52 <a href="/about">Home</a>
53 <br>
54 </div>
55 <div class="container">
56 <center> <div id="content" style="margin-top:2em">{% block content %}{% endblock %}</div></center>
57 </div>
58 </body>
59
60 <footer>
61 <script src="{{ url_for('static', filename='js/flask_main.js')}}" type="text/javascript"></script>
62 </footer>
63
64 </html>
```

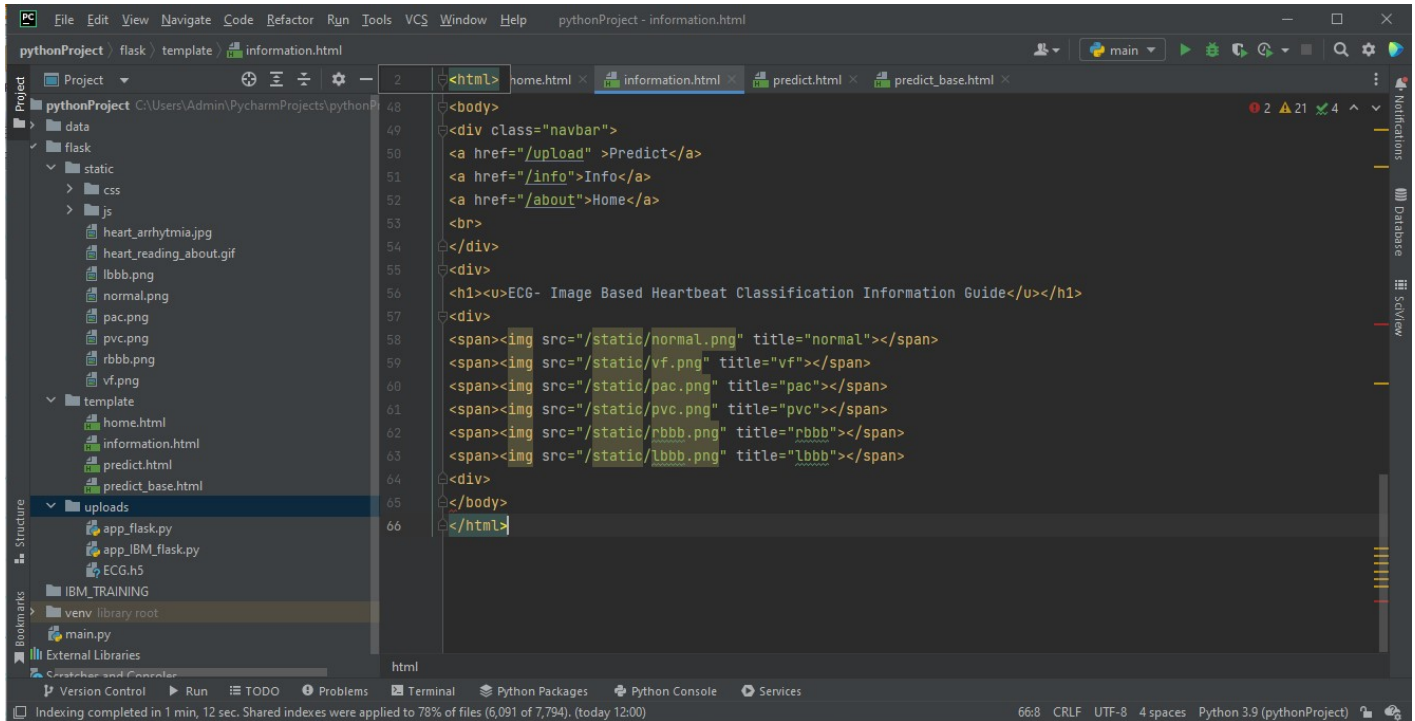
The HTML file used to build the Home.html



The screenshot shows the PyCharm IDE with the file `home.html` open. The left sidebar displays the project structure, including a `template` folder containing `home.html`, `information.html`, `predict.html`, and `predict_base.html`. The main editor area shows the HTML code for `home.html`, which includes a DOCTYPE declaration, a head section with a title and style, and a body section with a background image and a navbar. The status bar at the bottom indicates the file is using UTF-8 encoding, 4 spaces for indentation, and Python 3.9.

```
1 <!DOCTYPE html>
2 <html>
3 <head>
4 <title>Home</title>
5 <style>
6 body{
7 background-image: url('https://i.gifer.com/9lfW.gif');
8 background-size: 1400px 800px;
9 background-repeat: no-repeat;
10 padding: 0;
11 margin: 0;
12 overflow: hidden;
13 }
14 .pd{
15 padding-bottom: 100%;
16 }
17 .navbar{
18 margin: 0px;
19 padding: 20px;
20 background-color: white;
21 opacity: 0.6;
22 color: yellow;
23 font-family: 'Roboto', sans-serif;
24 font-style: normal;
```

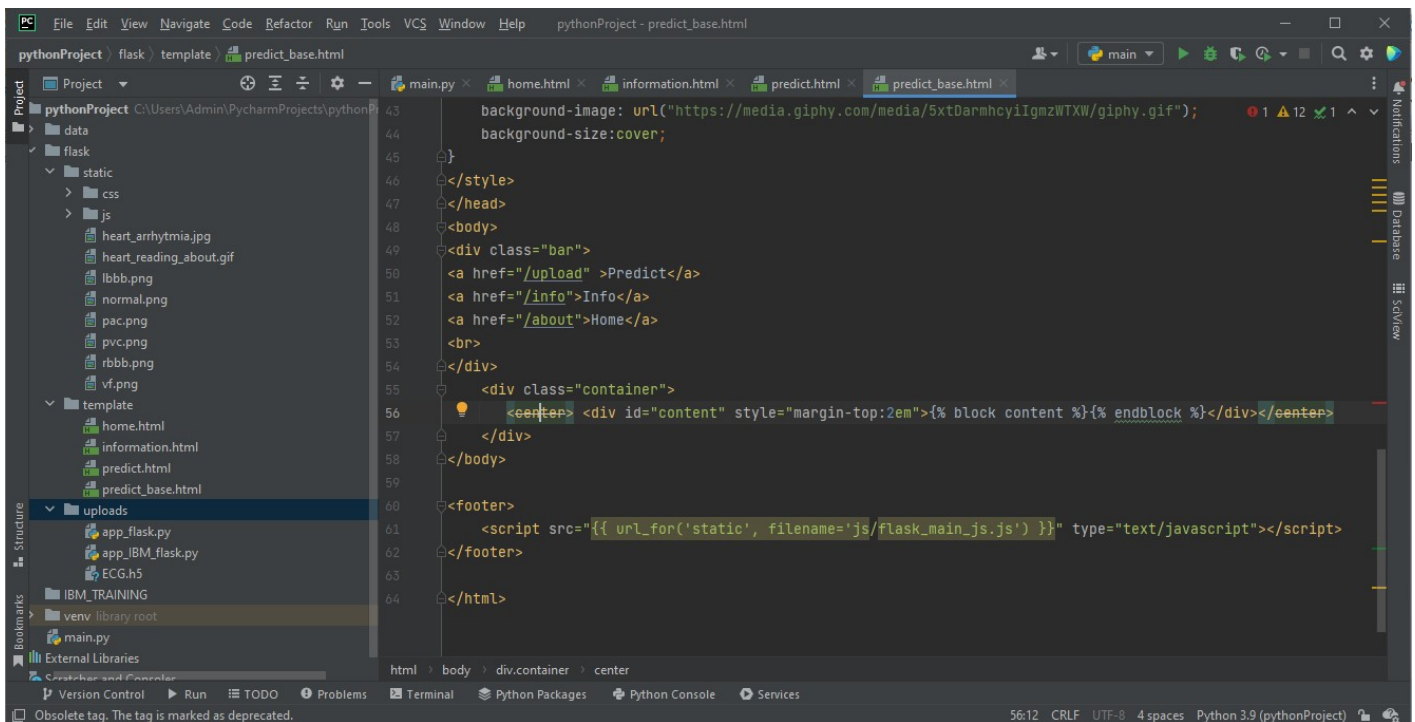
The HTML file used to build the information.html



The screenshot shows the PyCharm IDE with the 'information.html' file open. The file contains the following HTML code:

```
<body>
<div class="navbar">
  <a href="/upload" >Predict</a>
  <a href="/info">Info</a>
  <a href="/about">Home</a>
  <br>
</div>
<div>
  <h1><u>ECG- Image Based Heartbeat Classification Information Guide</u></h1>
<div>
  <span></span>
  <span></span>
  <span></span>
  <span></span>
  <span></span>
  <span></span>
</div>
</div>
</body>
</html>
```

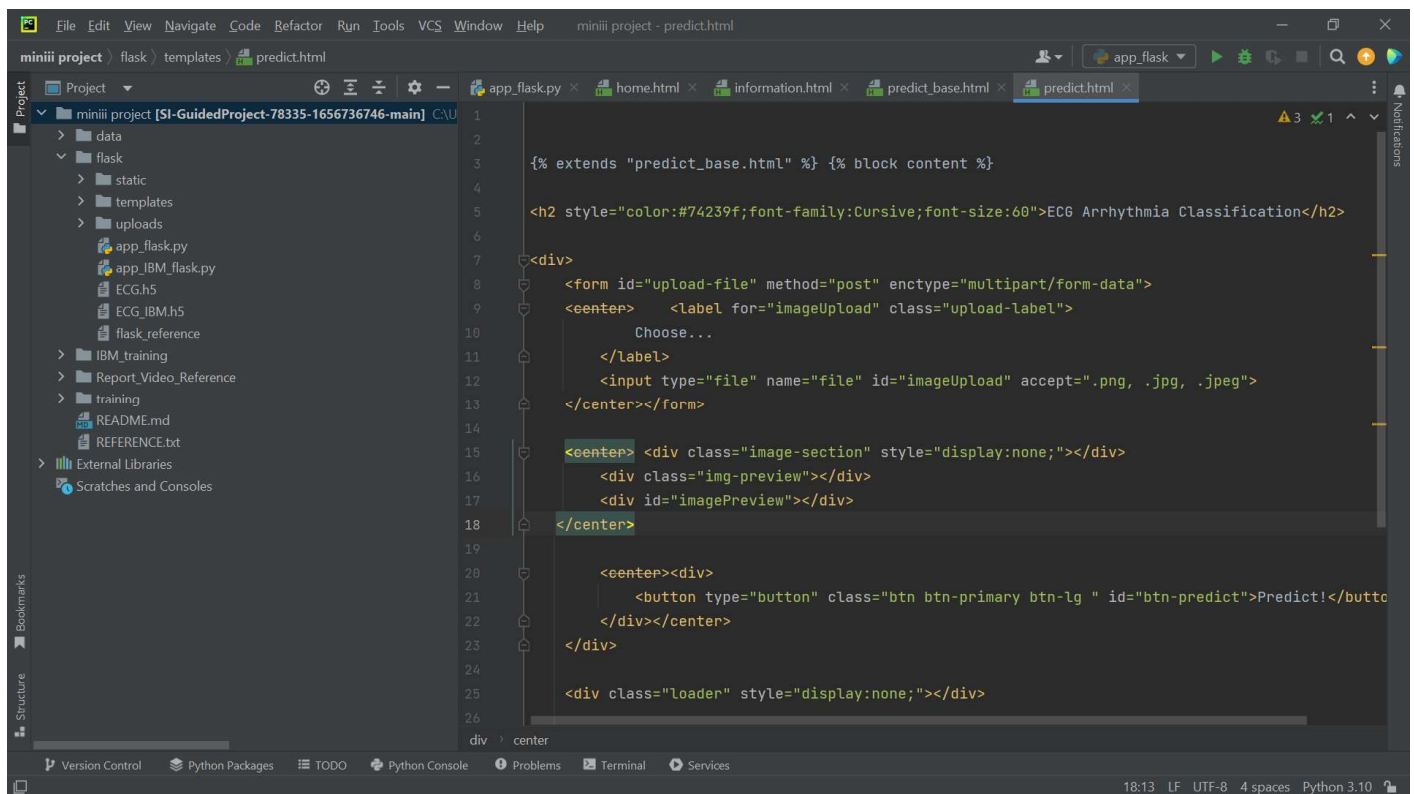
The HTML file used to build the predict_base.html



The screenshot shows the PyCharm IDE with the 'predict_base.html' file open. The file contains the following HTML code:

```
background-image: url("https://media.giphy.com/media/5xtDarmhcyIgmzWTXW/giphy.gif");
background-size:cover;
</style>
</head>
<body>
  <div class="bar">
    <a href="/upload" >Predict</a>
    <a href="/info">Info</a>
    <a href="/about">Home</a>
    <br>
  </div>
  <div class="container">
    <center> <div id="content" style="margin-top:2em">{% block content %}{% endblock %}</div></center>
  </div>
</body>
<footer>
  <script src="{{ url_for('static', filename='js/flask_main.js.js')}}" type="text/javascript"></script>
</footer>
</html>
```

The HTML file used to build the predicate.html



The screenshot shows an IDE window titled 'mini project - predict.html'. The left sidebar displays a project structure for 'mini project [SI-GuidedProject-78335-1656736746-main]'. The main editor area shows the content of 'predict.html', which extends from 'predict_base.html'. The HTML code includes a title 'ECG Arrhythmia Classification' and a form for file upload. The form has a label 'Choose...' and an input field for file selection. Below the form, there are sections for image preview and a 'Predict!' button. The code is as follows:

```
1
2
3 {% extends "predict_base.html" %} {% block content %}
4
5 <h2 style="color:#74239f;font-family:Cursive;font-size:60">ECG Arrhythmia Classification</h2>
6
7 <div>
8   <form id="upload-file" method="post" enctype="multipart/form-data">
9     <center> <label for="imageUpload" class="upload-label">
10       Choose...
11     </label>
12     <input type="file" name="file" id="imageUpload" accept=".png, .jpg, .jpeg">
13   </center></form>
14
15   <center> <div class="image-section" style="display:none;"></div>
16     <div class="img-preview"></div>
17     <div id="imagePreview"></div>
18   </center>
19
20   <center><div>
21     <button type="button" class="btn btn-primary btn-lg " id="btn-predict">Predict!</button>
22   </div></center>
23 </div>
24
25 <div class="loader" style="display:none;"></div>
26
```

The status bar at the bottom indicates the file is in UTF-8 encoding with 4 spaces, using Python 3.10.