SPRINT 3: Classification of Arrhythmia by Using Deep Learning With2-D ECG Spectral Image Representation

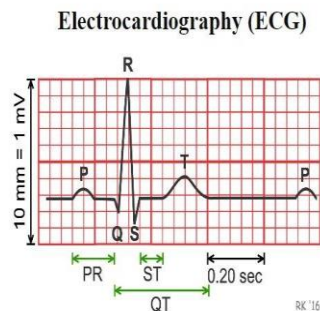## Description of USN and Screenshots:

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 Arrhythmia such as ECG, Coronary Heart Disease, Cardiomyopathy and its types.

Screenshot:

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.
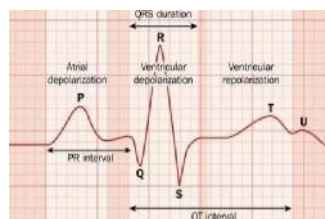
When is an ECG is used'*

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.
- Hearl 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 potenlially affect the heart.
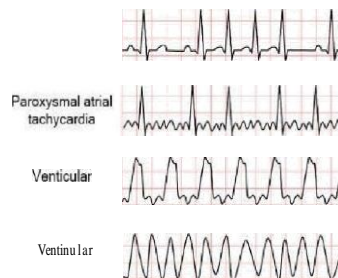
Normal ECG

A normal ECM is illustrated atove. Note fat the her is heatng in a regular sinus rhytA between 60 - 100 feats per rule(specifically 82 bpn), All tie important intewals on this retorting are within nomial ranges.
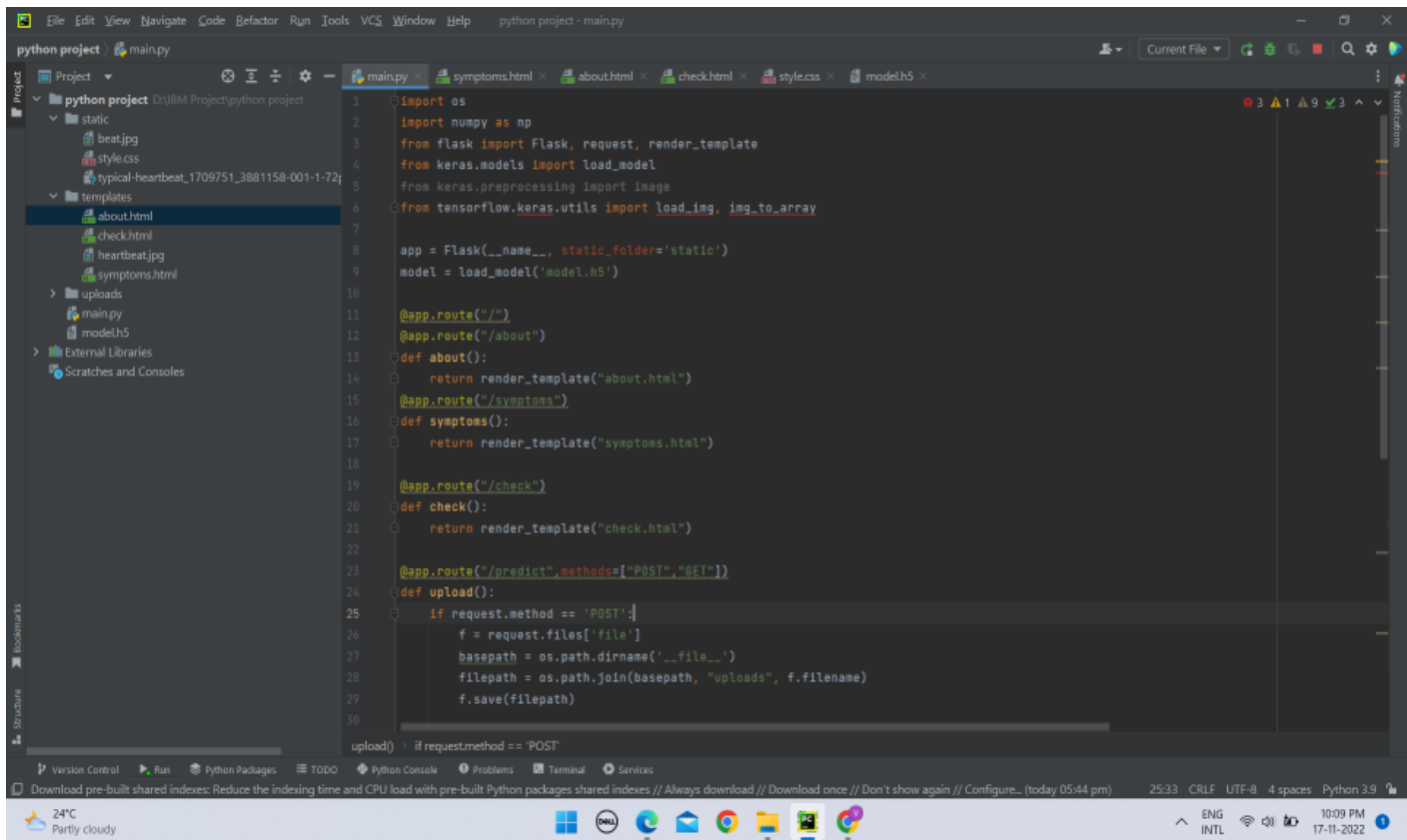
AfinormilECG

Types of arrhythmia
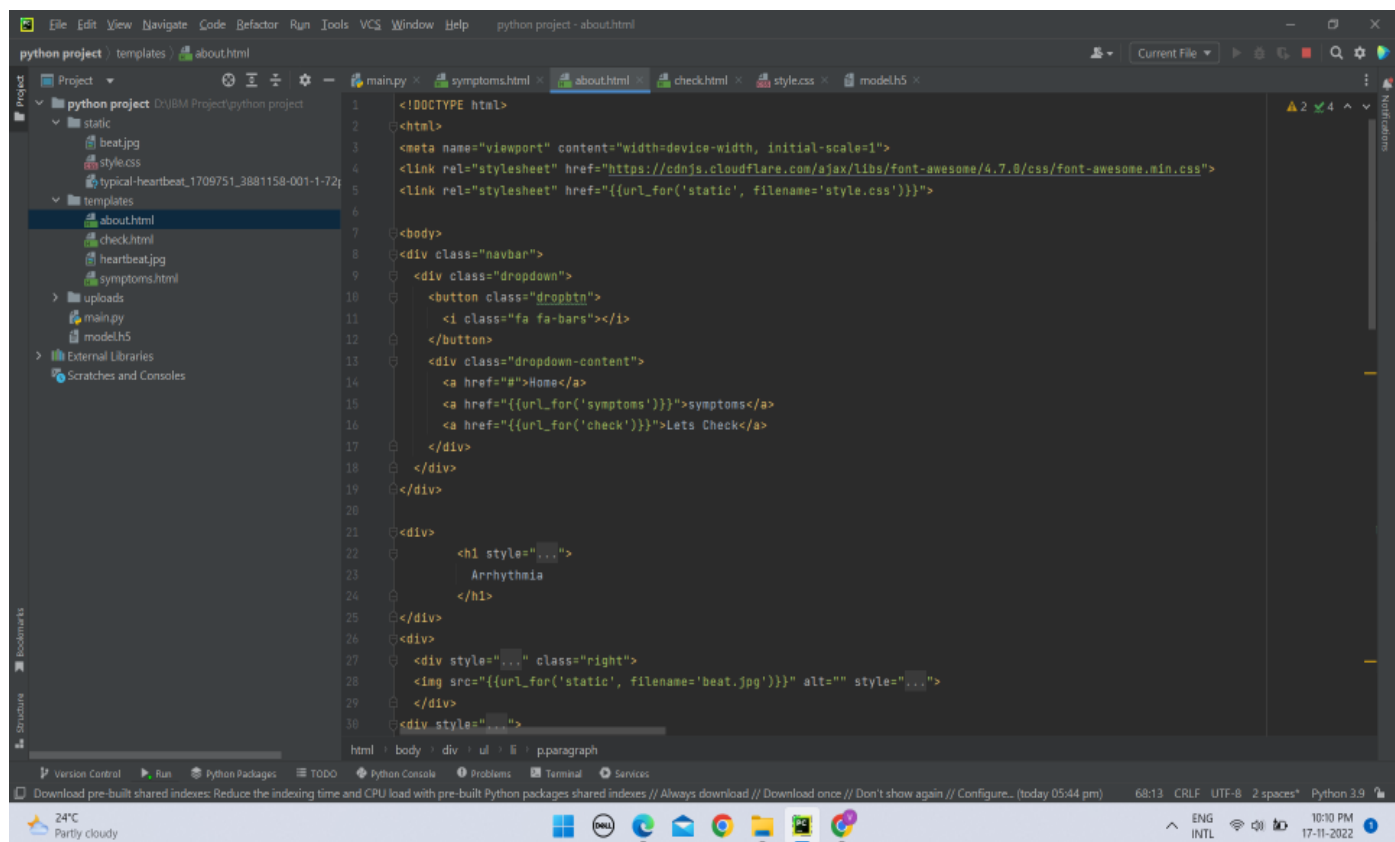
Paroxysmal atrial tachycardia

Venticular

Ventinular

Electrocardiographic abnormalities include first-degree heart block, nght anti lefi hunâle branch block, premature axial and ventricular contractions.

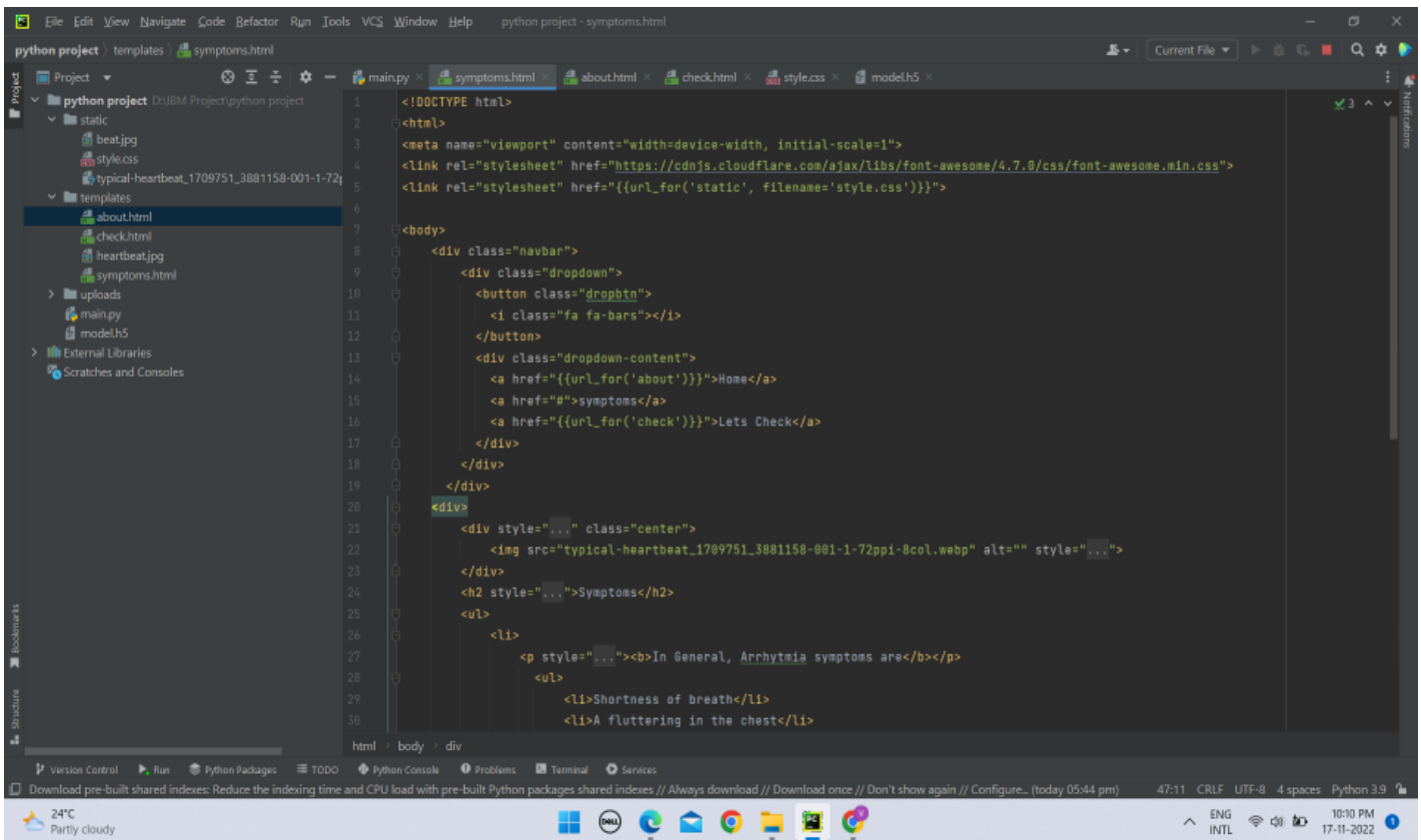The HTML file used to build the app_flask.py page includes:


```python
import os
import numpy as np
from flask import Flask, request, render_template
from keras.models import load_model
from keras.preprocessing import image
from tensorflow.keras.utils import load_img, img_to_array

app = Flask(__name__, static_folder='static')
model = load_model('model.h5')

@app.route("/")
@app.route("/about")
def about():
    return render_template("about.html")
@app.route("/symptoms")
def symptoms():
    return render_template("symptoms.html")


@app.route("/check")
def check():
    return render_template("check.html")


@app.route("/predict",methods=["POST","GET"])
def upload():
    if request.method == 'POST':
        f = request.files['file']
        basepath = os.path.dirname('__file__')
        filepath = os.path.join(basepath, "uploads", f.filename)
        f.save(filepath)
```

The HTML file used to build the about.html


```html
<!DOCTYPE html>
<html>
<meta name="viewport" content="width=device-width, initial-scale=1">
<link rel="stylesheet" href="https://cdnjs.cloudflare.com/ajax/libs/font-awesome/4.7.0/css/font-awesome.min.css">
<link rel="stylesheet" href="{{url_for('static', filename='style.css')}}">

<body>
<div class="navbar">
    <div class="dropdown">
        <button class="dropbtn">
            <i class="fa fa-bars"></i>
        </button>
        <div class="dropdown-content">
            <a href="#">Home</a>
            <a href="{{url_for('symptoms')}}">symptoms</a>
            <a href="{{url_for('check')}}">Lets Check</a>
        </div>
    </div>
</div>

<div>
        <h1 style="...">
            Arrhythmia
        </h1>
</div>
<div>
    <div style="..." class="right">
    <img src="{{url_for('static', filename='beat.jpg')}}" alt="" style="...">
    </div>
    <div style="...">
```

The HTML file used to build the symptoms.hmtl

The HTML file used to build the check.html

The HTML file used to build the style.css