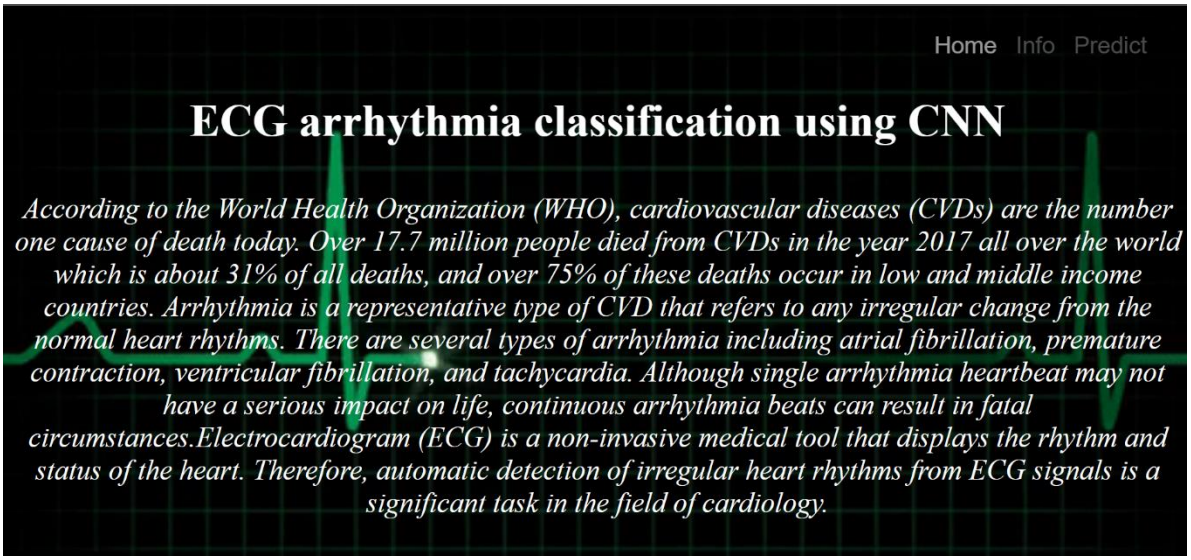
PROJECT DEVELOPMENT PHASE
SPRINT- IV

Team ID	PNT2022TMID18693
Title	Classification of Arrhythmia by Using Deep Learning with 2-D ECG Spectral Image Representation

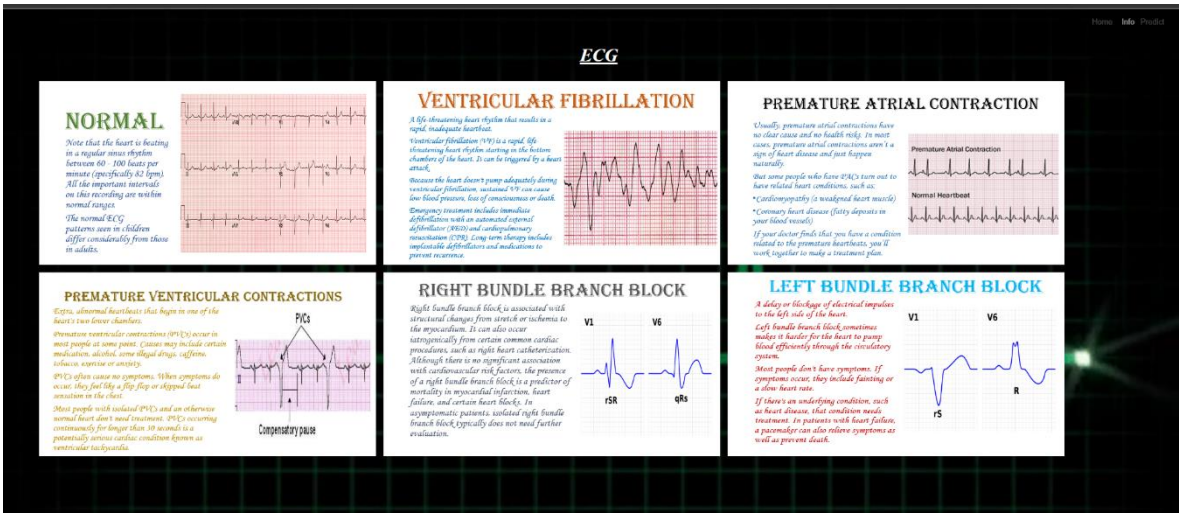
User Interface:

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 Left Bundle Branch Block , Right Bundle Branch Block , Premature Atrial Contraction , Premature Ventricular Contraction , Normal and Ventricular Fibrillation .

Screenshot:

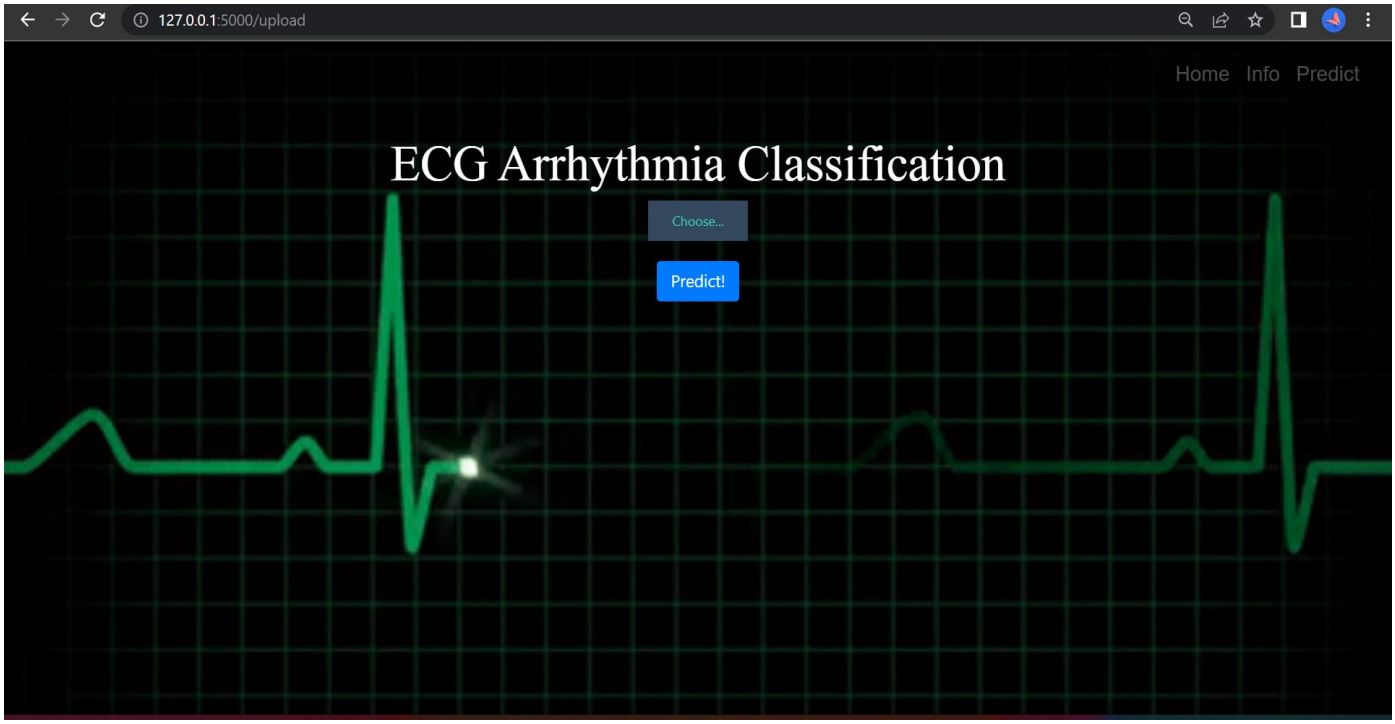


INFO PAGE:

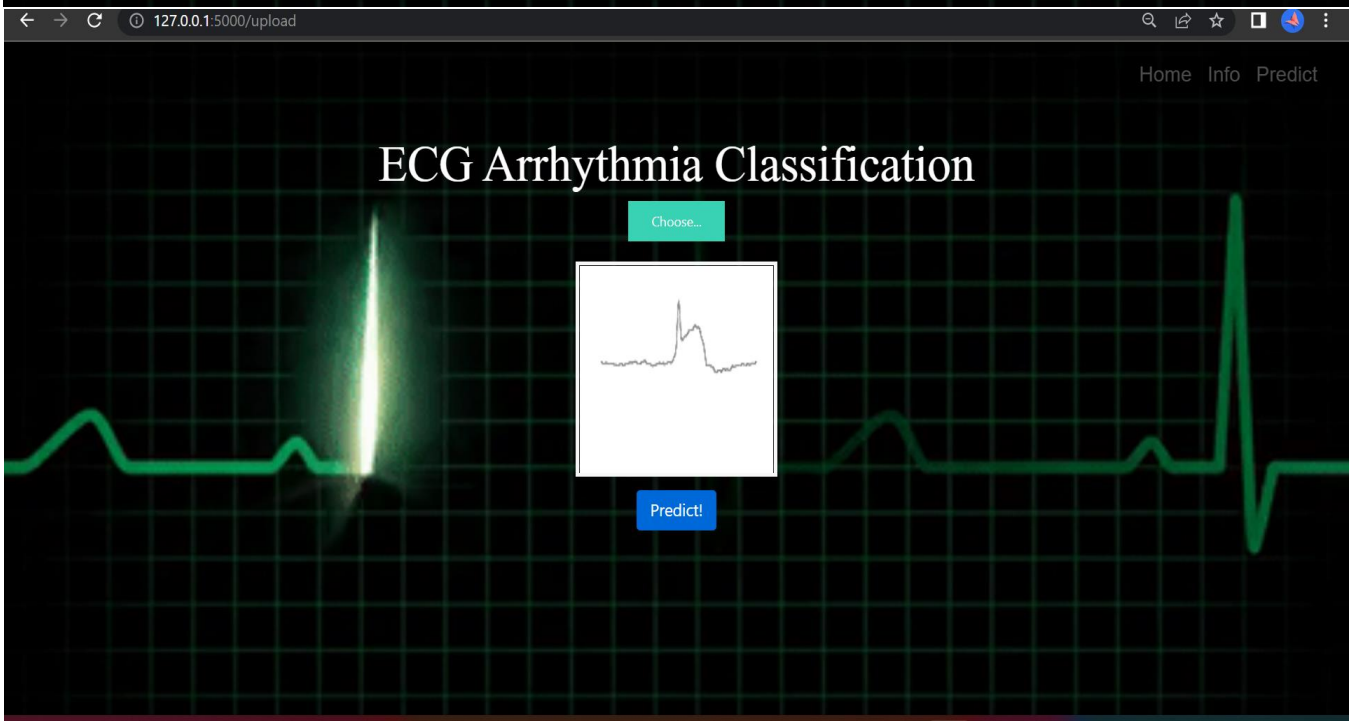

Home Info Predict
ECG
NORMAL
Note that the heart is beating in a regular sinus rhythm between 60 - 100 beats per minute (specifically 82 bpm). All the important intervals on this recording are within normal ranges.
The normal ECG patterns seen in children differ considerably from those in adults.
VENTRICULAR FIBRILLATION
A life-threatening heart rhythm that results in a rapid, inadequate heartbeat.
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.
Because the heart doesn't pump adequately during ventricular fibrillation, sustained VF can cause low blood pressure, loss of consciousness or death.
Emergency treatment includes immediate defibrillation with an automated external defibrillator (AED) and cardiopulmonary resuscitation (CPR). Long-term therapy includes implantable defibrillators and medications to prevent recurrence.
PREMATURE ATRIAL CONTRACTION
Usually, premature atrial contractions have no clear cause and no health risks. In most cases, premature atrial contractions aren't a sign of heart disease and just happen naturally.
But some people who have PACs turn out to have related heart conditions, such as:
*Cardiomyopathy (a weakened heart muscle)
*Coronary heart disease (fatty deposits in your blood vessels)
If your doctor finds that you have a condition related to the premature heartbeats, you'll work together to make a treatment plan.
Premature Atrial Contraction
Normal Heartbeat
PREMATURE VENTRICULAR CONTRACTIONS
Extra, abnormal heartbeats that begin in one of the heart's two lower chambers.
Premature ventricular contractions (PVCs) occur in most people at some point. Causes may include certain medication, alcohol, some illegal drugs, caffeine, tobacco, exercise or anxiety.
PVCs often cause no symptoms. When symptoms do occur, they feel like a flip-flop or skipped-beat sensation in the chest.
Most people with isolated PVCs and an otherwise normal heart don't need treatment. PVCs occurring continuously for longer than 30 seconds is a potentially serious cardiac condition known as ventricular tachycardia.
PVCs
Compensatory pause
RIGHT BUNDLE BRANCH BLOCK
Right bundle branch block is associated with structural changes from stretch or ischemia to the myocardium. It can also occur iatrogenically from certain common cardiac procedures, such as right heart catheterization. Although there is no significant association 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. In asymptomatic patients, isolated right bundle branch block typically does not need further evaluation.
V1
V6
rSR
qRs
LEFT BUNDLE BRANCH BLOCK
A delay or blockage of electrical impulses to the left side of the heart.
Left bundle branch block sometimes makes it harder for the heart to pump blood efficiently through the circulatory system.
Most people don't have symptoms. If symptoms occur, they include fainting or a slow heart rate.
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.
V1
V6
rS
R

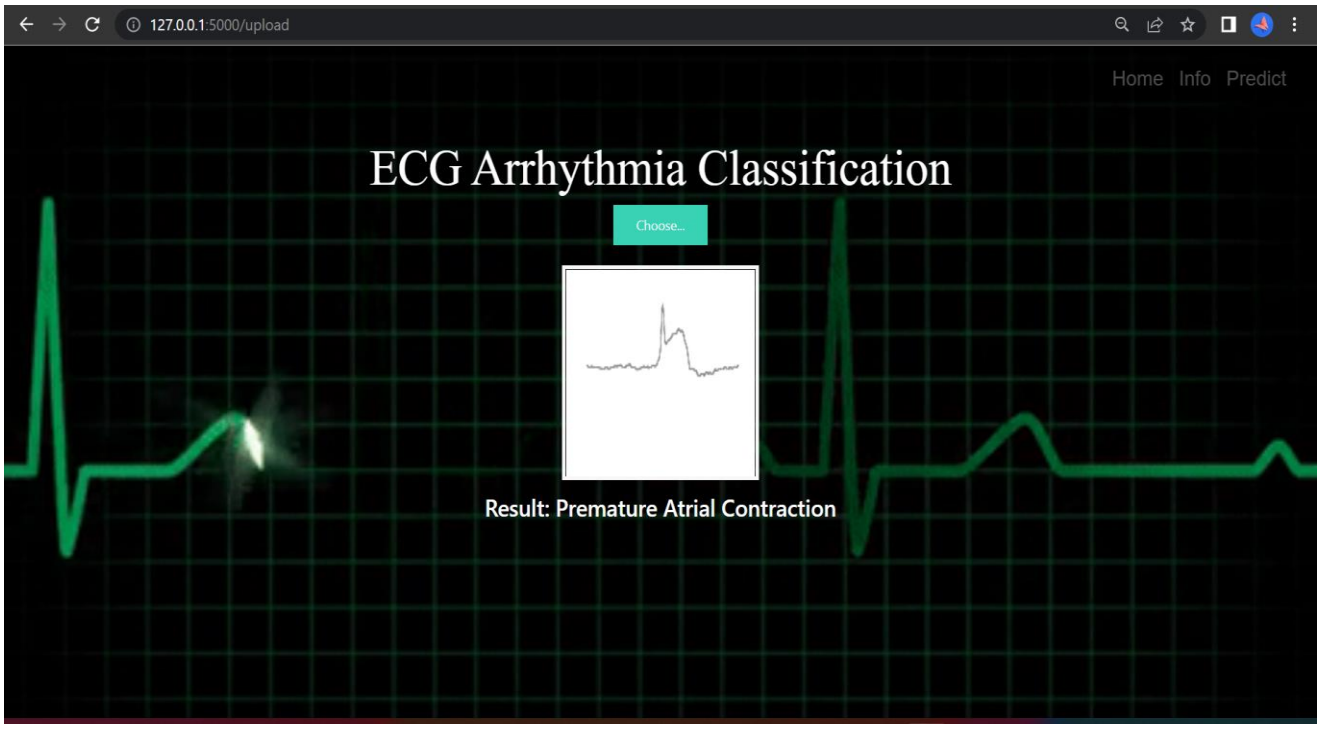
Predict:

As a user I can choose which ECG image should be uploaded to check the type of Arrythmia .After prediction the type of Arrythmia is displayed to the user.

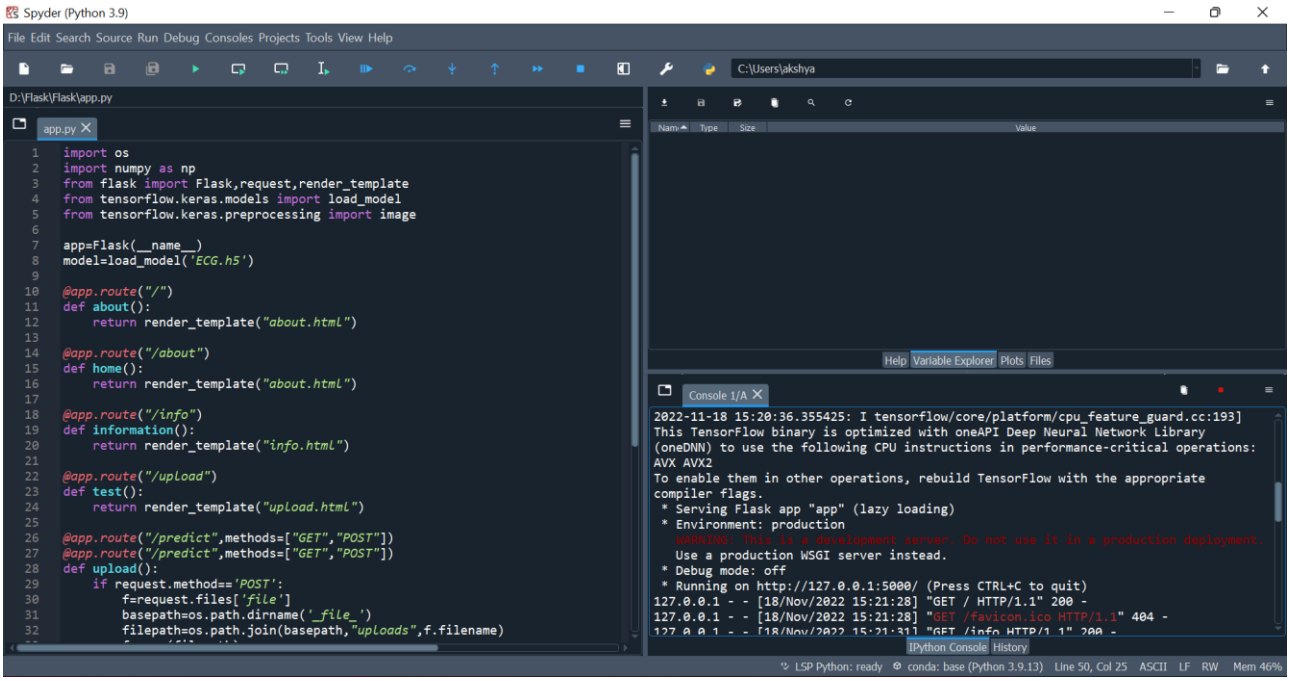


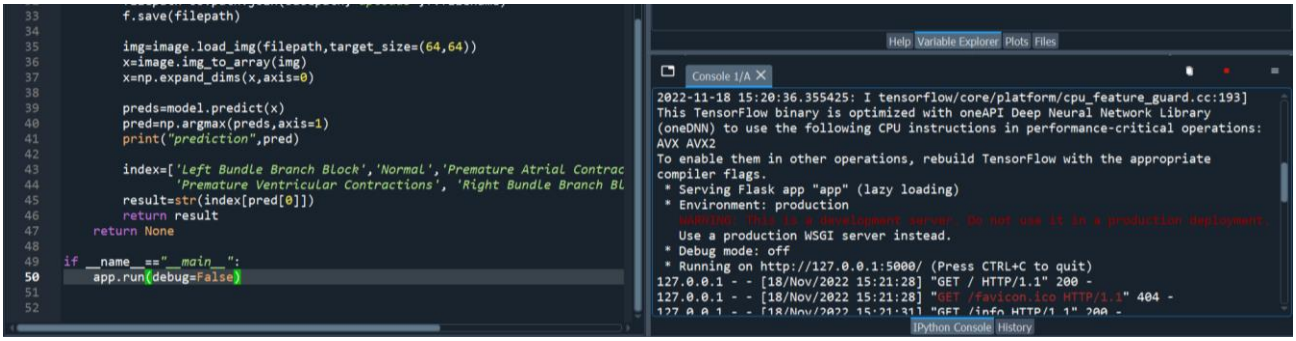

Open
test › Prematur...
Search Premature Atrial Cont...
Organize
New folder
Documents
Downloads
Music
Pictures
Videos
Windows (C:)
New Volume (D
Network
fig_23
fig_24
fig_25
fig_26
fig_27
fig_28
fig_29
fig_30
File name: fig_28
Custom Files
Open
Cancel
Home Info Predict
ia Classification
dict!


127.0.0.1:5000/upload
Home Info Predict
ECG Arrhythmia Classification
Choose...
Predict!


127.0.0.1:5000/upload
Home Info Predict
ECG Arrhythmia Classification
Choose...
Result: Premature Atrial Contraction

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





TheHTMLfile used to build the predicate.html