Project Name: Deep learning modeling of Electrocardiogram (ECG) signal.

1. In this project, an open-access database from PhysioNet has been used.
   The link to the database is given below:
   https://physionet.org/content/ptbdb/1.0.0/

2. The input and output datasets have been prepared for the binary 12-lead ECG classification problem. Namely; Normal ECG signal versus Myocardial infarction ECG signal.

3. The shape of the input data is considered to be (173, 4000, 12), where 173 is the number of points/trials, 4000 is the length of the sequence and 12 is the number of leads of ECG signal.

4. Similarly, the shape of the output data is considered to be (173,1).

5. The training and testing ratio is 70:30.
   The training and validation ratio is 90:10

6. The deep learning 1D CNN model is implemented referring to the below paper.
   https://www.mdpi.com/2076-3417/9/14/2870

7. Performance metrics are evaluated to obtain the model performance. The model has obtained an accuracy of 67.30%.

8. The performance of the model can be improved if

- ☐ The dataset size is very large.
- ☐ The parameters of the 1D CNN model can be optimized further (such as; the number of filters, kernel size, etc.) manually to optimize the model performance.

- ☐ The number of epochs can be changed.
- ☐ The time-frequency (TF) images of the ECG signal can be used as features to improve the performance of the model.
- ☐ The advanced deep learning models like 2D CNN along with LSTM/ Transfer learning models can be used to improve the performance further.