In this Jupyter notebook, we will embark into the fascinating realm of electrocardiogram (ECG) signal processing and classification. Our tool of choice for this exploration is a Convolutional Neural Network (CNN) Autoencoder. The dataset we'll be working with is the PTB Diagnostic ECG Database, which has been carefully curated to provide high-quality ECG signals designed specifically for diagnostic purposes. Our main goal is to build a robust Autoencoder model customized for the task of identifying abnormal ECG signals.

The PTB Diagnostic ECG Database comprises 14,552 ECG recordings, which have been obtained from the PTB Diagnostic Database hosted on Physionet. These ECG signals are classified into two distinct categories: one category represents normal heartbeats, while the other category includes heartbeats affected by cardiac abnormalities. The dataset offers high-resolution data as it is sampled at a rate of 125Hz, enabling in-depth analysis.

Here are some key details about the PTB Diagnostic ECG Database:

- Total Number of Samples: 14,552

- Number of Categories: 2

- Sampling Frequency: 125Hz

- Data Source: Physionet's PTB Diagnostic Database (https://www.physionet.org/content/ptbdb/1.0.0/)