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# HeartBeat Classification

**Relevant training course:** Data Scientist

**Level of difficulty:** 08/10

**Description of the project:**

*The heart signals described within electrocardiograms (ECGs) describe the heartbeats of normal patients and patients with arrhythmias or myocardial infarction.*
*The goal of this project is to implement deep neural network architectures that will help in the classification of cardiac signals. Transfer learning techniques can also be studied within this project.*

**Resources to refer to:**

- **Data:**
  - This dataset combines two collections of cardiac signals: MIT-BIH Arrhythmia Dataset and The PTB Diagnostic ECG Database. The number of samples in these two collections is large enough to allow the training of deep neural networks.
  - These signals have undergone certain transformations and have been segmented so that they can be studied. Each segment of the signal corresponds to one heartbeat.
  - https://www.kaggle.com/shayanfazeli/heartbeat

- **Bibliography:**
  - https://www.analyticsvidhya.com/blog/2021/07/artificial-neural-network-simplified-with-1-d-ecg-biomedical-data/
  - https://www.datasci.com/solutions/cardiovascular/ecg-research

- **Benchmark:**
  - Preprocessing, Deep Learning, Transfer Learning

**Validation conditions for the project:**

- an exploration, data visualization and data pre-processing **report** ;
- a modeling **report** ;
- a final **report** and associated **GitHub**.