

INTRODUCTION:

* Biomedical signals like ECG (Electrocardiogram) and EEG (Electroencephalogram) are very important in diagnosing and monitoring health conditions. These signals often have noise from sources like muscle movements, baseline drift and electrical interference.

* Filtering techniques are essential to extract meaningful data from these signals. This project focuses on filtering ECG and EEG signals using Python, especially using a Butterworth Bandpass Filter to remove unwanted noise and preserve useful frequencies.

OBJECTIVES:

- * To import and preprocess ECG/EEG data from user-collected files.
- * To calculate sampling frequency from time-series data.
- * To apply bandpass filtering using Butterworth filter to remove noise.
- * To visualize and compare the original and filtered signals.
- * To allow user to choose between ECG and EEG data processing.

TOOLS and TECHNOLOGIES:

- * Programming Language : Python (using Python IDE)

* Libraries used:

- Pandas - For handling .csv or .xlsx files.
- numpy - For numerical operations.
- matplotlib - For plotting graphs.
- Scipy signal - for signal processing (especially Butterworth filter).

Methodology:

Data Input and Preprocessing



Sampling Frequency Calculation



Bandpass Filtering (4^{th} order)



Visualization

Result:

- * The Graphical results are represented in the

Pictures below !!