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# Speech Emotion Recognition

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## **PROBLEM:**

*Speech Emotion Recognition, abbreviated as SER, is the act of attempting to recognize human emotion and affective states from speech. This is capitalizing on the fact that voice often reflects underlying emotion through tone and pitch. This is also the phenomenon that animals like dogs and horses employ to be able to understand human emotion.*

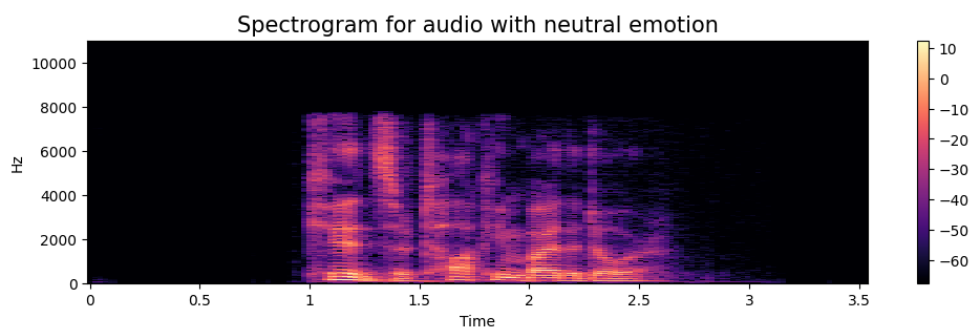
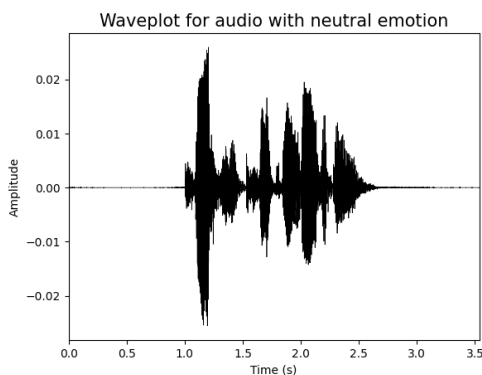
## **OUR SOLUTION:**

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Firstly, google drive was mounted. We wrote two functions to plot the waveform and spectrogram of an audio signal using the matplotlib and librosa libraries. The functions work as follows

There are two functions, 'plot\_waveform' and 'create\_spectrogram', which plot the audio signal as a waveplot and a spectrogram, respectively. The waveplot function uses `ax.plot()` and `plt.show()`, while the spectrogram function uses `librosa.stft()` and `librosa.display.specshow()`. An audio file is loaded using `librosa` and the functions are called to plot the waveform and spectrogram, with the audio being played using `Audio()`. The associated emotion is set to "neutral". Similarly, we can plot the waveplot and spectrogram for other emotions.



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Signal processing extracts audio features using techniques like spectrum analysis and Fourier Transform, revealing frequency and amplitude changes over time. Spectrograms capture frequency, time, and amplitude information, and MFCCs can be extracted and used to determine audio classes from file names.

### **FEATURE EXTRACTION:**

We created functions for feature extraction and audio data augmentation to improve machine learning model performance on audio data.

### **SELECTED MODEL:**

We used pipeline to find the best model. We found that LightGradientBoosting model was the best model with 76.31% accuracy.

### **Contribution -**

1. Sindhav Khushal- performed data visualization and preprocessing on the dataset and helped in performing the report.
2. Shaurya Mishra - performed feature extraction and helped in preparing the report.
3. Chaitravi Kane- trained classifiers and calculated their accuracies and determined the best classifier from all of the classifiers.