**Project Requirements**

**Software Requirements**

**Python 3.8+:** Ensure you have Python installed. You can download it from the [official Python website](https://www.python.org/downloads/).

**Python Packages**

The project requires several Python packages which can be installed via `pip`. These are listed in the `requirements.txt` file. Below are the key dependencies:

- TensorFlow 2.x: Deep learning library for model training and evaluation.

- Keras: High-level API for building and training deep learning models (integrated with TensorFlow).

- scikit-learn: Machine learning library for model training and evaluation.

- pandas: Data manipulation and analysis library.

- numpy: Library for numerical computations.

- librosa: Audio processing library for feature extraction.

- matplotlib: Plotting library for visualizations.

**Hardware Requirements**

- Processor: Multi-core processor (Intel i5/i7, AMD equivalent or better recommended)

- RAM: 8 GB or more (16 GB recommended)

- Storage: SSD with at least 20 GB free space

- GPU: (Optional but recommended) NVIDIA GPU with CUDA support for faster training

**Setup and Installation**

1. Clone the repository:

2. Create and activate a virtual environment:

3. Install required Python packages

**Dataset**

- Download the dataset: Obtain the speech dataset required for this project. The dataset should include audio files and corresponding labels.

- Organize the dataset: Place the dataset in a directory named `data` at the root of the project.

**Execution**

1. Feature extraction: Extract features from the speech dataset.

2. Model training: Train the ML and DL models using the extracted features.

3. Model evaluation: Evaluate the performance of the trained models.

4. Result visualization: Visualize the results of the model evaluation.