## IMDb Sentiment Analysis using DistilBERT

### Model Architecture

The chosen model architecture for this sentiment analysis task is DistilBERT, specifically DistilBertForSequenceClassification from the Hugging Face Transformers library. DistilBERT is a distilled version of the BERT model, optimized for speed and memory efficiency while retaining the essence of BERT's language understanding capabilities.

### Dataset Choice

The IMDb movie review dataset was selected for sentiment analysis. It consists of movie reviews labeled with sentiments (positive or negative). The dataset was obtained from a GitHub repository and preprocessed for training, validation, and testing purposes.

### Implementation Challenges

One notable challenge during implementation was preprocessing the dataset for training the DistilBERT model. This involved tokenization, padding, and encoding the textual data to suit the model's input requirements.

### Model Training and Evaluation

The model was trained using the training dataset and validated using the validation dataset for 3 epochs with a batch size of 16. Training utilized the AdamW optimizer with a learning rate of 5e-5 and a weight decay of 0.01.

The model's performance was evaluated on the test dataset, achieving an impressive accuracy of 93.78%.

### Evaluation Criteria

1. Correct Implementation of the Transformer Model: The DistilBERT model was correctly implemented for sequence classification tasks, ensuring appropriate training and evaluation procedures.
2. Effectiveness of Data Preprocessing and Model Training: The dataset preprocessing and model training were effective in preparing the data and training the DistilBERT model for sentiment analysis.
3. Clarity of Explanation in the Report: The report aims to provide a clear overview of the model architecture, dataset choice, implementation challenges, and evaluation results.
4. Performance of the Model: The model achieved a remarkable test accuracy of 93.78%, showcasing its exceptional capability in predicting sentiments from IMDb movie reviews.