

Model Development Phase Template

Date	15 November 2024
TeamID	739909
Project Name	Unlocking the Minds: Analyzing Mental Health with NLP
Maximum Marks	5 Marks

Model Selection Report

In this project, various machine learning models were evaluated to analyze mental health data using Natural Language Processing (NLP) techniques. The selection process involved assessing performance, complexity, and computational efficiency to determine the most effective model for the given task.

Model Selection Report:

Model	Description
DecisionTree Classifier	Decision Tree Classifier is particularly useful for "Unlocking the Minds: Analyzing Mental Health with NLP" due to its interpretability and ability to handle both categorical and numerical data. It excels in capturing non-linear patterns often present in mental health-related text data.
RandomForest Classifier	Random Forest Classifier is well-suited for this project due to its capability to efficiently handle large feature spaces and its robustness against overfitting through ensemble averaging. This makes it ideal for analyzing complex patterns in mental health text data.

AdaBoost Classifier	AdaBoost Classifier enhances text prediction accuracy by combining weak learners into a strong model. It excels in handling imbalanced datasets and is particularly effective in improving classification performance in mental health-related text analysis through adaptive boosting techniques.
Gradient Boosting Classifier	Gradient Boosting Classifier is ideal for mental health text analysis as it builds robust models by iteratively optimizing a loss function. Its ability to capture intricate patterns in the data ensures high accuracy for nuanced NLP tasks in this domain.
Logistic Regression	Logistic Regression is effective for binary or multiclass text classification tasks within this project. Its simplicity, interpretability, and use of the sigmoid function make it suitable for distinguishing subtle patterns in mental health-related text data.
Support Vector Classifier	Support Vector Classifier (SVM) is particularly effective for high-dimensional textual data. Its kernel-based transformations allow it to classify complex patterns, and its robustness to overfitting ensures reliable predictions, even with limited labeled data in mental health analysis.