Student Mental Health Analysis System

SUBMITTED BY:

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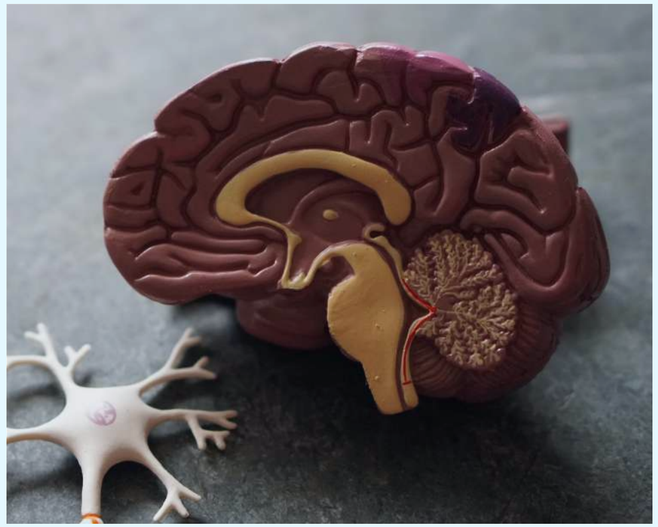
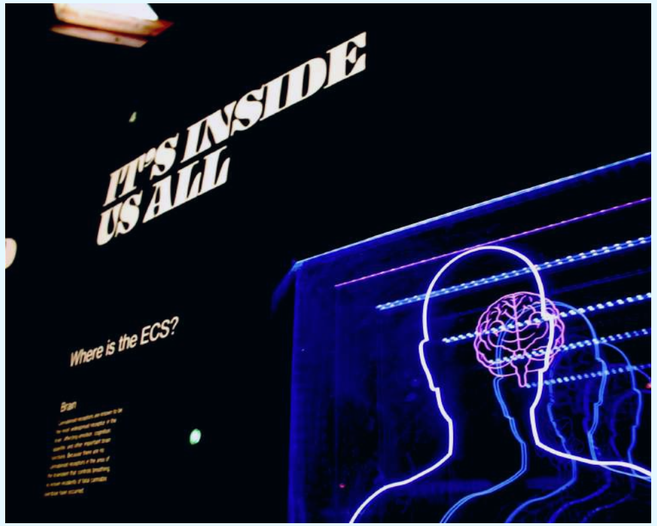
Technology & Healing

The "Student Mental Health Analysis" project aims to analyze students mental health using efficient machine learning techniques, as mental health among students is a critical concern related to their academic success and overall well being. The main focus of this project is the application of many machine learning models to assist in the diagnosis of mental health issues in students.



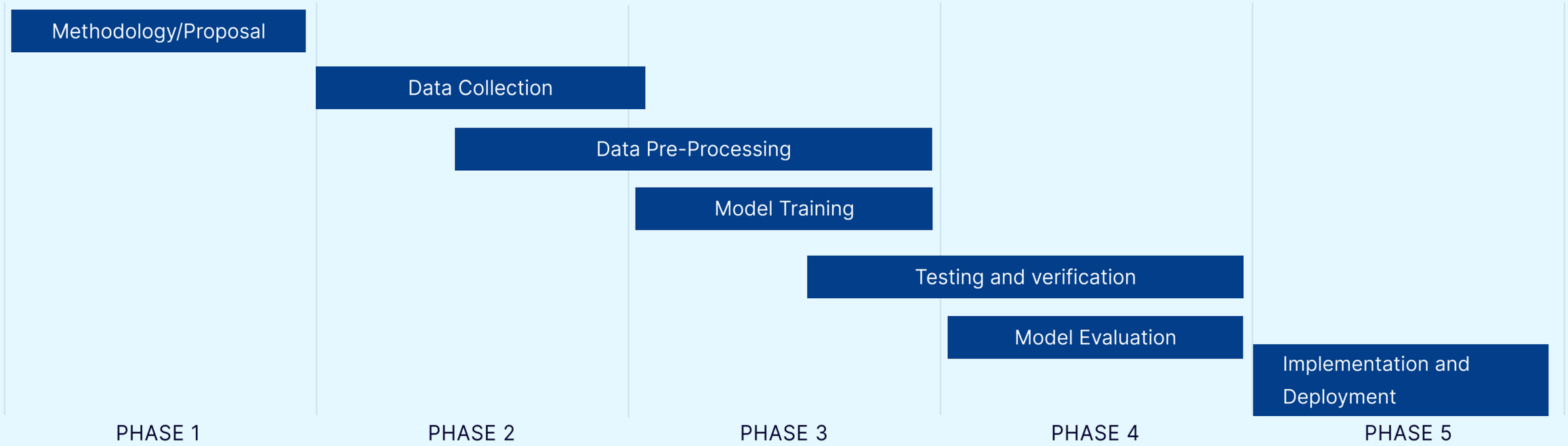


Problem Statement

The goal of this project is to forecast students' mental well-being based on a variety of criteria such as lifestyle, demographics, and sentiment analysis of textual replies provided by them. Stress, anxiety, and depression among students are on the rise, and this can be attributed to a variety of factors, including academic pressure. This project aims to identify such mental health issues early on to promote student well-being.

Implementation

Integration of the machine learning model into real-world applications is a pivotal step in our project. This timeline explores how to seamlessly incorporate our innovative solution into various contexts to address mental health analysis.



Data Collection

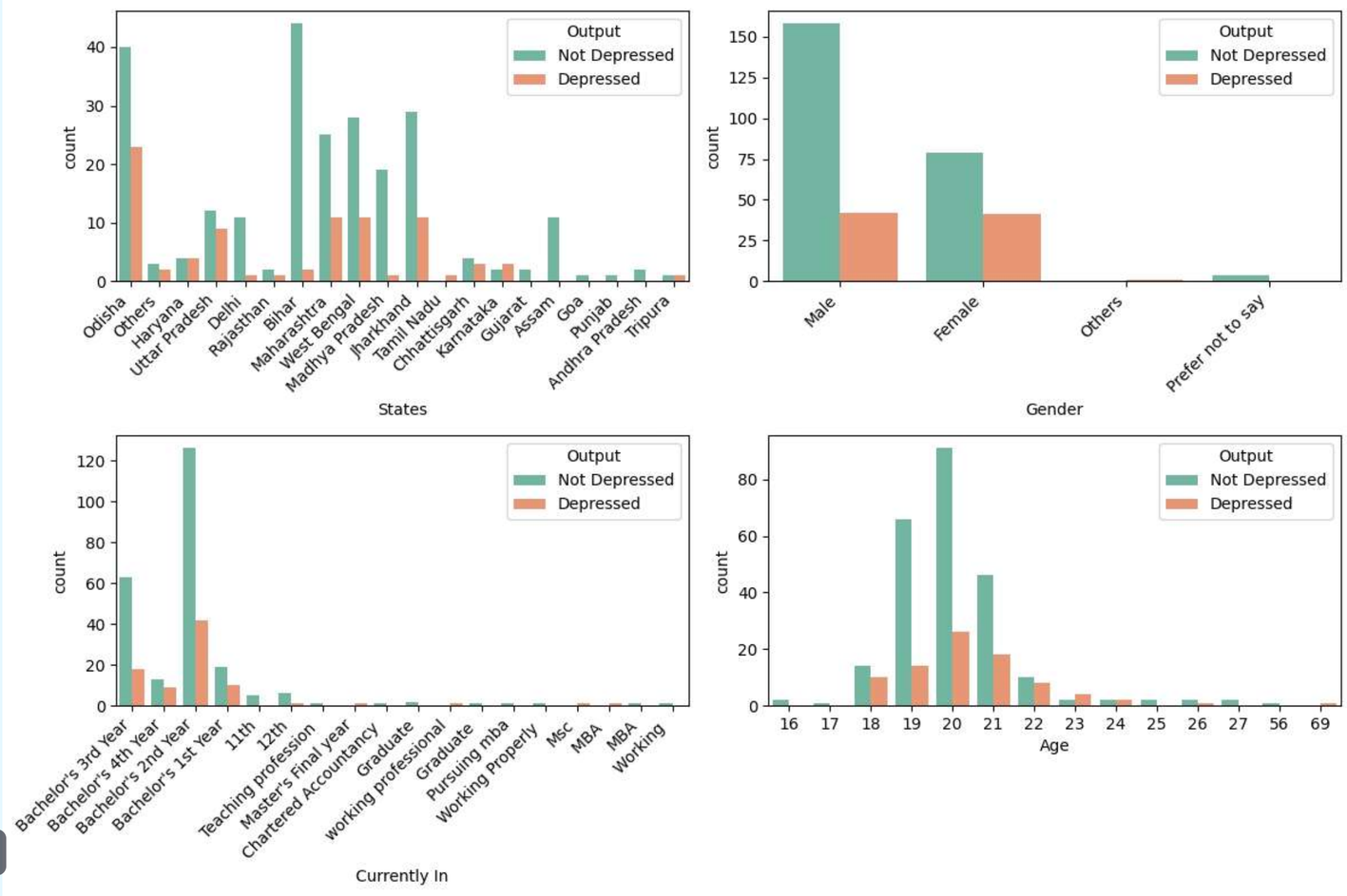
SOURCES

Collected data using Google Forms and circulated the forms to gather responses.

TECHNIQUES

Utilized various techniques like missing value handling, one-hot encoding, data cleaning, and feature extraction as part of our preprocessing pipeline.

Unlocking the mysteries of mental health through data-driven insights



- **Age:** The highest percentage of people who are depressed is in the 22-27 age group. Overall, depression appears to be more common among younger adults.
- **Gender:** The graphs show a higher percentage of females reporting depression than males.
- **Occupation:** Working professionals and MBA students may experience higher rates of depression compared to other occupations. However, further research with larger sample sizes is needed to confirm this trend.
- **State:** The graphs do not show a clear pattern for depression rates by state.

Machine Learning Algorithms

1. **RANDOM FOREST:**
   - ENSEMBLE METHOD FOR COMPLEX MENTAL HEALTH PATTERNS.
   - CLASSIFIES MENTAL WELLNESS AND PREDICTS ANXIETY/DEPRESSION.
2. **NEURAL NETWORKS:**
   - CAPTURES INTRICATE MENTAL HEALTH PATTERNS.
   - USED FOR SENTIMENT ANALYSIS AND MOOD PREDICTION.
3. SUPPORT VECTOR MACHINES (SVM):
   - EFFECTIVE IN HIGH-DIMENSIONAL MENTAL HEALTH DATA.
   - OPTIMAL CLASSIFICATION BOUNDARIES FOR DIFFERENT STATES.

AFTER COMPARING VARIOUS MACHINE LEARNING MODELS INCLUDING RANDOM FOREST, NEURAL NETWORKS, AND SUPPORT VECTOR MACHINES (SVM), WE SELECTED RANDOM FOREST AS THE MOST SUITABLE MODEL FOR OUR PROJECT.

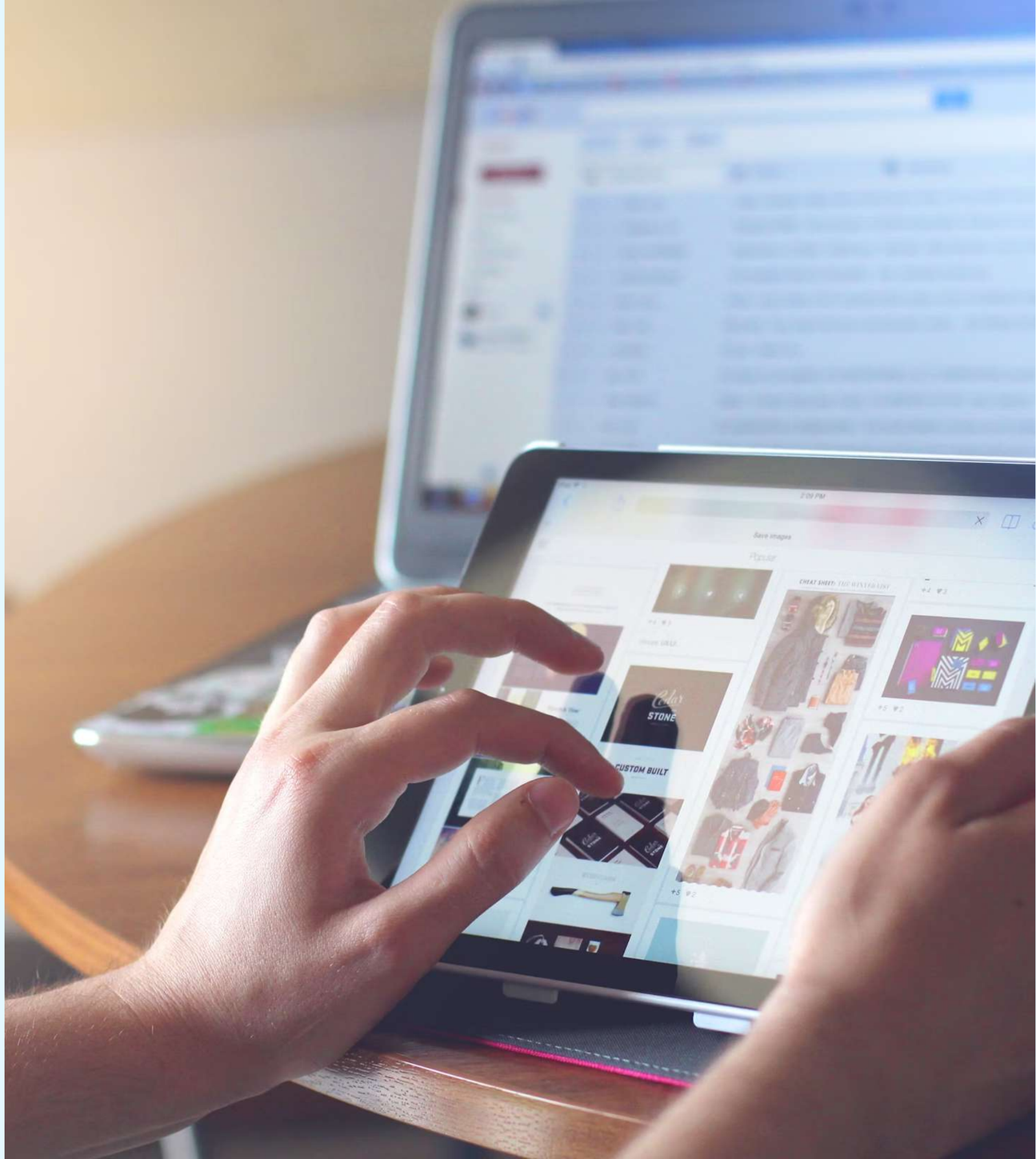
WEB Deployment

Created a web application using Flask, a Python web framework, designed to predict depression risk and provide support through an intuitive user interface.

- **Depression Risk Prediction:** Our trained model analyzes user responses to carefully designed questions, offering a preliminary risk assessment of depression.
- **User Interface:**

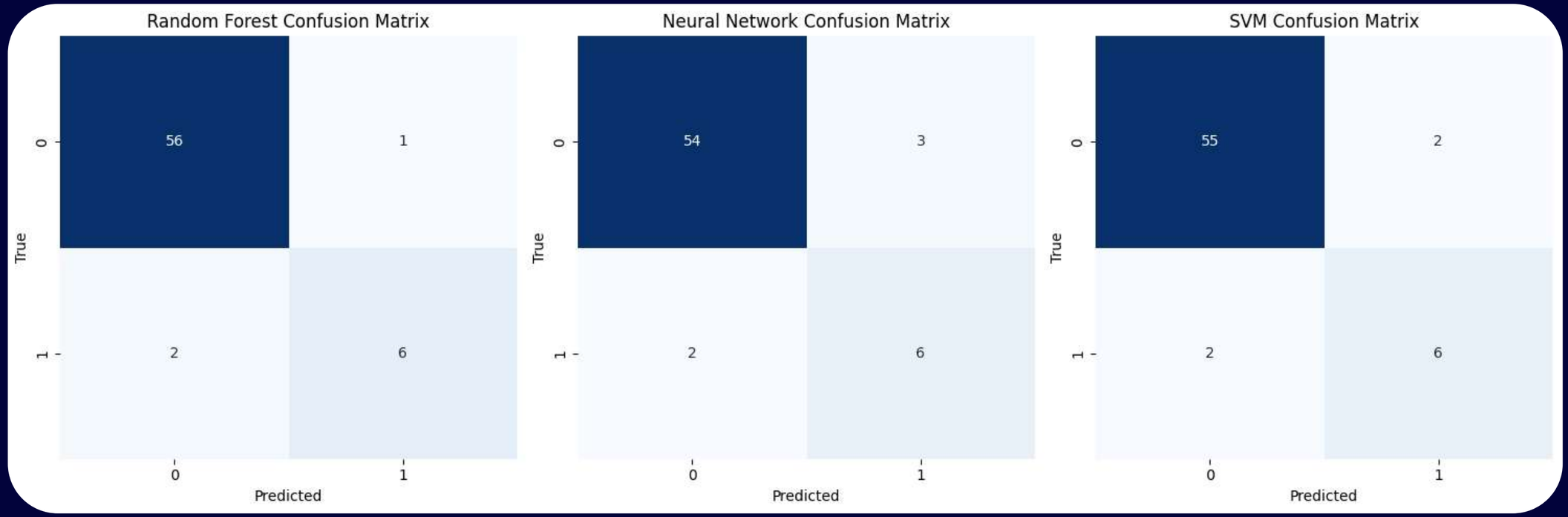
  Intuitive Design: Simplifying the support process for users with:

  1. Dropdown Menus: Efficient selection of options
  2. Radio Buttons: Clear choice selection
  3. Text Input: Space for users to express themselves in their own words.

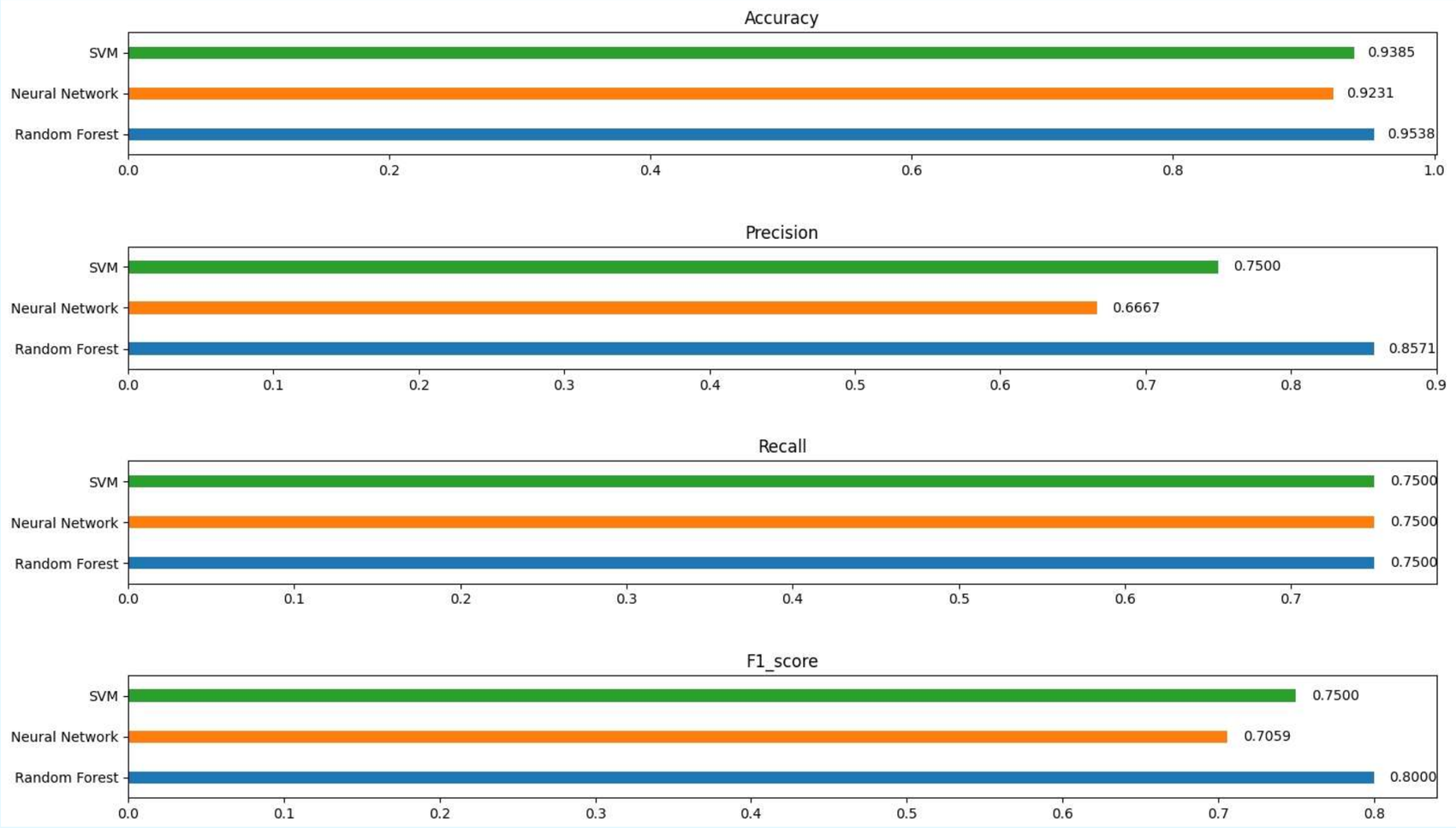


Results and Insights:

CONFUSION MATRIX:



Results and Insights:



Evaluation Metrices: 1. Accuracy 2. Precision 3. Recall 4. F1-Score

Summary of the mental health analysis project

- Developed a model leveraging machine learning and sentiment analysis to understand and address student mental well-being.

- Employed rigorous preprocessing and feature extraction for accurate data modeling, with sentiment analysis offering profound insights into students' mental states.

- The model's predictive abilities provide valuable applications for educational and mental health professionals, enabling targeted interventions and improved support resources based on identified mental health patterns.

Pitch

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