Mental Health Wellbeing Project: Using ML to Promote Safety

This project utilizes machine learning to analyze student phone data and identify potential behavioral changes. The goal is to create a safe and supportive learning environment.

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TECH STACK:
Python
Libraries for Data Processing: NumPy, Pandas
Machine Learning Library: Scikit-Learn
Email Handling: smtplib, email.mime
Environment Variables Management: python-dotenv
Data Storage Format: CSV
SMTP Service: Gmail's SMTP server

MENTAL HEALTH

Tracking Student Activities through Phone Data

Screen Time

The system tracks the time spent on various apps and websites. This data provides insights into a student's online activities.

Website Visits

The system logs the websites visited by the student, providing a comprehensive picture of their online interests.

Machine Learning Model for Behavioral Analysis

1 Data Collection

The System simulates random Set of Data.

2 Feature Engineering

The collected data is transformed into meaningful features that can be used by the ML model.

3 Model Training

The ML model is trained on historical data to identify patterns and predict future behavior.

4 Model Evaluation

The model's performance is evaluated to ensure accuracy and reliability before deployment.

Detecting Concerning Behavior Patterns

1   Abnormal Usage

The system monitors for sudden changes in app usage patterns, such as excessive time spent on specific apps.
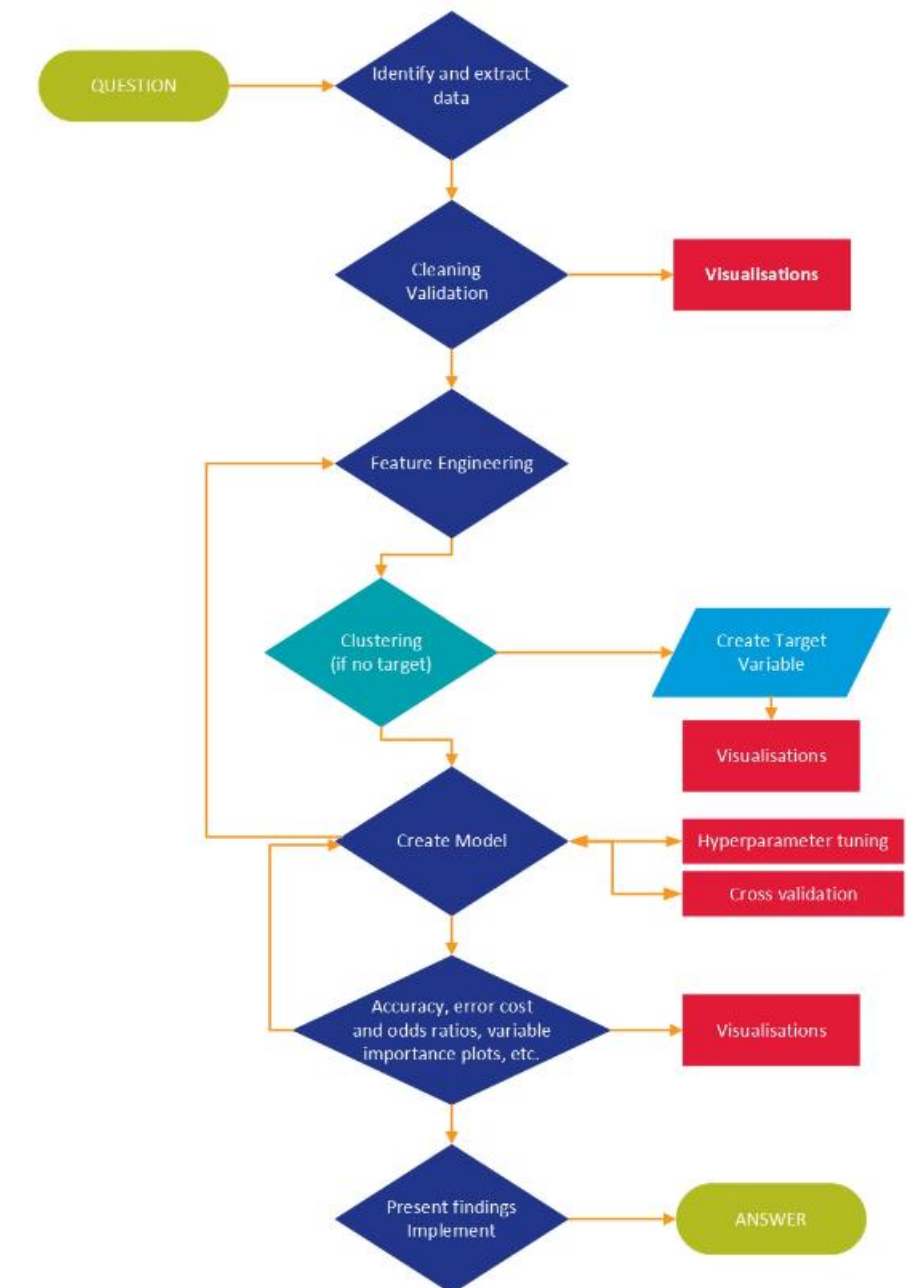
2   Website Content

The system analyzes website content and flags potential instances of harmful or inappropriate websites visited by the student.

3   Keyword Recognition

The system identifies keywords related to self-harm, bullying, or other concerning topics in web searches or text messages.

Creating a Machine Learning Model

QUESTION → Identify and extract data → Cleaning Validation → Visualisations

Feature Engineering → Clustering (if no target) → Create Target Variable → Visualisations

Create Model → Hyperparameter tuning / Cross validation

Accuracy, error cost and odds ratios, variable importance plots, etc. → Visualisations

Present findings Implement → ANSWER

Alerting Parents and Guardians

Automated Alerts

If the system identifies a concerning behavior pattern, it automatically sends an alert to the student's parents or guardians.

Digest Alerts

It will provide the parent with a monthly report of what the student has been visiting.

Conclusion and Future Advancement

Customizable Settings

Parents can customize the alert thresholds and receive notifications based on their preferred level of monitoring.

Resource Recommendations

The system can provide parents with access to helpful resources and support organizations related to the detected issue.

Ongoing Enhancements

This is just the beginning – future development will focus on incorporating more advanced machine learning techniques and exploring real-time behavior monitoring capabilities to better support student mental health wellbeing.