

MENTAL HEALTH PREDICTION

Milestone 1: Project Initialization and Planning Phase

The Project Initialization and Planning Phase involves setting clear objectives, assembling a multidisciplinary team, and securing necessary resources. Key activities include gathering and preprocessing diverse datasets, selecting machine learning algorithms, and establishing ethical guidelines for data use. Collaboration with mental health professionals ensures relevance and accuracy, while a detailed timeline and risk assessment guide project execution.

Activity 1: Define Problem Statement

The problem statement of mental health prediction involves identifying and predicting individuals at risk of mental health issues using various data sources and analytical methods. Accurate prediction models can help in early intervention and personalized treatment plans, reducing the severity and impact of mental health disorders. Challenges include the complexity and variability of mental health conditions, data privacy concerns, and the need for integrating diverse data types such as medical history, lifestyle factors, and socio-economic indicators. Developing robust, ethical, and interpretable prediction models is crucial for improving mental health outcomes and providing timely support to those in need.

Problem Statement Report: [click here](#)

Activity 2: Project Proposal (Proposed Solution)

This project aims to develop a predictive model for identifying individuals at risk of mental health issues using diverse data sources. The goal is to enable early intervention, personalized treatment, and improved mental health outcomes while addressing ethical and privacy concerns.

Project Proposal Report: [click here](#)

Activity 3: Initial Project Planning

Initial project planning involves defining objectives, gathering diverse datasets, selecting appropriate machine learning algorithms, and addressing ethical and privacy concerns. Key steps include data preprocessing, model training, validation, and testing. Collaboration with mental health professionals is essential for interpreting results and ensuring the model's accuracy and applicability in real-world settings.

Project Planning Report: [click here](#)

Milestone 2: Data Collection and Preprocessing Phase

The Data Collection and Preprocessing Phase involves gathering diverse datasets, including medical records, lifestyle factors, and socio-economic indicators. Data preprocessing steps include cleaning, normalization, and handling missing values. Ensuring data privacy and compliance with ethical standards is crucial, alongside feature selection and engineering to prepare the data for model training.

Activity 1: Data Collection Plan, Raw Data Sources Identified, Data Quality Report

The Data Collection Plan outlines the strategy for obtaining medical records, lifestyle data, and socio-economic indicators. Raw data sources identified include electronic health records, surveys, wearable devices, and public databases. The Data Quality Report assesses completeness, accuracy, and consistency, ensuring high-quality data for reliable mental health prediction modeling.

Data Collection Report: [click here](#)

Activity 2: Data Quality Report

Data quality for mental health prediction involves ensuring accuracy, completeness, and consistency of data from diverse sources. It includes validating data integrity, addressing missing values, and standardizing formats to enhance the reliability and effectiveness of predictive models for accurate mental health risk assessment.

Data Quality Report: [click here](#)

Activity 3: Data Exploration and Preprocessing

Data Exploration and Preprocessing involve analyzing collected datasets to understand their structure and patterns. Key steps include handling missing values, outlier detection, normalization, and feature selection. Visualizations aid in identifying trends and anomalies, ensuring the data is clean and well-prepared for training effective mental health prediction models.

Data Exploration and Preprocessing Report: [click here](#)

Milestone 3: Model Development Phase

The Model Development Phase involves selecting suitable algorithms, training predictive models, and fine-tuning hyperparameters. Techniques such as cross-validation ensure robustness. Collaboration with domain experts helps refine models, aiming for high accuracy and generalizability in predicting mental health risks.

Activity 1: Feature Selection Report

The feature selection report identifies relevant predictors from diverse data sources, ensuring they contribute effectively to predictive accuracy while minimizing redundancy and overfitting in mental health prediction models.

Feature Selection Report: [click here](#)

Activity 2: Model Selection Report

Model selection for mental health prediction involves evaluating various algorithms (e.g., logistic regression, decision trees, neural networks) based on performance metrics like accuracy and interpretability. Techniques such as cross-validation help identify the most suitable model for predicting mental health outcomes reliably.

Model Selection Report: [click here](#)

Activity 3: Initial Model Training Code, Model Validation and Evaluation Report

Model selection for mental health prediction involves evaluating various algorithms (e.g., logistic regression, decision trees, neural networks) based on performance metrics like accuracy and interpretability. Techniques such as cross-validation help identify the most suitable model for predicting mental health outcomes reliably.

Model Development Phase Template: [click here](#)

Milestone 4: Model Optimization and Tuning Phase

In the Model Optimization and Tuning Phase, hyperparameters are fine-tuned using techniques like grid search or randomized search. Feature selection methods and ensemble techniques may be applied to enhance model performance. Validation

against unseen data ensures optimal configuration for accurate mental health prediction.

Activity 1: Hyperparameter Tuning Documentation

Hyperparameter tuning for mental health prediction involves optimizing model settings (like learning rate, batch size) to enhance predictive accuracy and generalizability. Techniques include grid search, random search, and Bayesian optimization, aiming to find the best configuration for reliable mental health assessments.

Activity 2: Performance Metrics Comparison Report

Performance metrics like accuracy, precision, recall, and F1-score are crucial for evaluating mental health prediction models. These metrics measure predictive effectiveness, ensuring models correctly identify and classify mental health conditions based on in

Activity 3: Final Model Selection Justification

The final model selection for mental health prediction involves choosing the model with the highest validation performance metrics (e.g., accuracy, sensitivity). This ensures robustness and reliability in identifying mental health conditions from diverse datasets.

Model Optimization and Tuning Phase Report: [click here](#)

Milestone 5: Project Files Submission and Documentation

For project file submission in Github, Kindly click the link and refer to the flow. [click here](#)

For the documentation, Kindly refer to the link. [click here](#)

Milestone 6: Project Demonstration

In the upcoming module called Project Demonstration, individuals will be required to record a video by sharing their screens and explain their project and demonstrate its execution during the presentation.