Vitamin Vision: Unveiling The Spectrum Of Nutrient Detection

Milestone 1: Project Initialization and Planning Phase

The "Project Initialization and Planning Phase" marks the project's outset, defining goals, scope, and stakeholders. This crucial phase establishes project parameters, identifies key team members, allocates resources, and outlines a realistic timeline. It also involves risk assessment and mitigation planning. Successful initiation sets the foundation for a well-organized and efficiently executed machine learning project, ensuring clarity, alignment, and proactive measures for potential challenges.

Activity 1: Define Problem Statement

Problem Statement: A food consumer wants to know the type of vitamin he consumes when he intake food and he is not aware of the vitamins which are present majorly in the food!

Ref. template:
Problem Statement Report: Click here

Activity 2: Project Proposal (Proposed Solution)

The purpose of this proposal is to help the consumers to consume their food with proper details about the food. Some might be allergic to specific vitamins intake. So this project might help them out by helping them know the type of vitamin does the food has in it.

Project Proposal Report: Click here

Activity 3: Initial Project Planning

Initial Project Planning involves outlining key objectives, defining scope, and identifying stakeholders for a loan approval system. It encompasses setting timelines, allocating resources, and determining the overall project strategy. During this phase, the team establishes a clear understanding of the dataset, formulates goals for analysis, and plans the workflow for data processing. Effective initial planning lays the foundation for a systematic and well-executed project, ensuring successful outcomes.

SmartLender Project Planning Report: Click here

Milestone 2: Data Collection and Preprocessing Phase

The Data Collection and Preprocessing Phase involves executing a plan to gather relevant loan

application data from Kaggle, ensuring data quality through verification and addressing missing values. Preprocessing tasks include cleaning, encoding, and organizing the dataset for subsequent exploratory analysis and machine learning model development.

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

For this project , our team has took the data sets from Kaggle . This data has moderate quality. The test data set has unlabelled data and we labelled them as per the vitamin it contains.

Data Collection Report: Click here

Activity 2: Data Quality Report

Data Quality Report: Click here

Activity 3: Data Exploration and Preprocessing

Data Exploration involves analyzing the loan applicant dataset to understand patterns, distributions, and outliers. Preprocessing includes handling missing values, scaling, and encoding categorical variables. These crucial steps enhance data quality, ensuring the reliability and effectiveness of subsequent analyses in the loan approval project.

Data Exploration and Preprocessing Report: Click here

Milestone 3: Model Development Phase

The Model Development Phase entails crafting a predictive model for vitamin detection.

Activity 1: Model Selection Report

We specify the model which is suitable based on its performance on the training.

Model Selection Report: **Click here**

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

Model Development Phase Template: Click here

Milestone 4: Model Optimization and Tuning Phase

The Model Optimization and Tuning Phase involves refining machine learning models for peak performance. It includes optimized model code, fine-tuning hyperparameters, comparing performance metrics, and justifying the final model selection for enhanced predictive accuracy and efficiency.

Activity 1: Hyperparameter Tuning Documentation

The Gradient Boosting model was selected for its superior performance, exhibiting high accuracy during hyperparameter tuning. Its ability to handle complex relationships, minimize overfitting, and optimize predictive accuracy aligns with project objectives, justifying its selection as the final model.

Activity 2: Performance Metrics Comparison Report

The Performance Metrics Comparison Report contrasts the baseline and optimized metrics for various models, specifically highlighting the enhanced performance of the Gradient Boosting model. This assessment provides a clear understanding of the refined predictive capabilities achieved through hyperparameter tuning.

Activity 3: Final Model Selection Justification

The Final Model Selection Justification articulates the rationale for choosing Gradient Boosting as the ultimate model. Its exceptional accuracy, ability to handle complexity, and successful hyperparameter tuning align with project objectives, ensuring optimal loan approval predictions.

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

Milestone 6: Project Demonstration

To see the demonstration please visit the github and check out the video. Click here