OPTIMISING FOOD DELIVERY USING ML

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
Food delivery optimization involves using machine learning to enhance the efficiency of delivery operations. This includes predicting delivery times, optimizing delivery routes, and improving customer satisfaction through timely and accurate deliveries. The goal is to use data-driven insights to streamline operations, reduce costs, and enhance the customer experience.

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Activity 2: Project Proposal (Proposed Solution)
This project aims to develop a machine learning model to optimize food delivery by predicting delivery times and optimizing delivery routes based on various factors such as traffic conditions, weather, and order characteristics. The model will be integrated into a web-based application to provide real-time predictions and recommendations, helping food delivery services operate more efficiently and effectively.
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Activity 3: Initial Project Planning

This involves outlining key objectives, defining the scope, and identifying stakeholders for the food delivery optimization project. 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 and timely delivery of the final product.

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Milestone 2: Data Collection and Preprocessing Phase

The Data Collection and Preprocessing Phase involves executing a plan to gather relevant data from food delivery operations, 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

The dataset for the food delivery optimization project is sourced from food delivery platforms, including details on order times, delivery routes, traffic conditions, weather, and customer ratings. Data quality is ensured through thorough verification, addressing missing values, and adhering to ethical guidelines, establishing a reliable foundation for accurate predictive modeling. This meticulous approach is essential for developing a robust machine learning model that can effectively optimize food delivery operations..

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Activity 2: Data Quality Report

Ensuring the integrity of the dataset by handling missing values, removing duplicates, and validating the accuracy of recorded information. This step is critical to ensure that the machine learning models built on this data are reliable and robust.

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Activity 3: Data Exploration and Preprocessing

Analyzing the food delivery 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 predicting and optimizing delivery operations.

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Milestone 3: Model Development Phase

The Model Development Phase entails crafting a predictive model for optimizing food delivery operations. It encompasses strategic feature selection, evaluating and selecting models (Decision Tree, Random Forest, XGBoost, KNN), initiating training with code, and rigorously validating and assessing model performance for informed decision-making.

Activity 1: Feature Selection Report

Outlining the rationale behind choosing specific features for the food delivery optimization model. It evaluates relevance, importance, and impact on predictive accuracy, ensuring the inclusion of key factors influencing the model's ability to optimize delivery operations.

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Activity 2: Model Selection Report

Detailing the rationale behind choosing Decision Tree, Random Forest, XGBoost, and KNN models for optimizing food delivery. It considers each model's strengths in handling complex relationships, interpretability, adaptability, and overall predictive performance, ensuring an informed choice aligned with project objectives.

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

Employing selected algorithms on the food delivery dataset, setting the foundation for predictive modeling. The subsequent Model Validation and Evaluation Report rigorously assesses model performance, employing metrics like R^2 score and RMSE to ensure reliability and effectiveness in predicting and optimizing delivery operations.

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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: 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 final selected model. This assessment provides a clear understanding of the refined predictive capabilities achieved through hyperparameter tuning.

Activity 2: Final Model Selection Justification

The Final Model Selection Justification articulates the rationale for choosing the ultimate model. Its exceptional accuracy, ability to handle complexity, and successful alignment with project objectives ensure optimal predictions and efficient food delivery operations.

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Milestone 5: Project Files Submission and Documentation

For project file submission in Github, Kindly click the link and refer to the flow.

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. They will need to explain their project and demonstrate its execution during the presentation.