FOOD DEMAND FORECASTING FOR FOOD DELIVERY COMPANY

Milestone 1: Project Initialization and Planning Phase

The "Project Initialization and Planning Phase" marks the project's outset, defining goals, scope. Food Demand Forecasting for a Food Delivery Company using IBM Cloud involves leveraging advanced data analytics and machine learning algorithms to predict the future demand for various food items. By analyzing historical data such as order volumes, time of day, day of the week, weather conditions, and special events, the system can forecast the demand accurately. This helps the food delivery company optimize its operations by efficiently allocating resources, reducing wastage, and ensuring timely delivery to customers.

Activity 1: Define Problem Statement

Problem Statement: A food delivery service has to deal with a lot of perishable raw materials which makes it all, the most important factor for such a company is to accurately forecast daily and weekly demand. Too much inventory in the warehouse means more risk of wastage, and not enough could lead to out-ofstocks - and push customers to seek solutions from your competitors. The replenishment of majority of raw materials is done on weekly basis and since the raw material is perishable, the procurement planning is of utmost importance, the task is to predict the demand for the next 10 week

Problem Statement Report: click here

Activity 2: Project Proposal (Proposed Solution)

Food demand forecasting for a food delivery company serves several key purposes: . *Inventory Management*: Accurate forecasts help manage the stock of ingredients and supplies, reducing waste and ensuring that popular items are always available. . *Cost

Optimization*: By predicting demand, companies can optimize purchasing and production processes, leading to cost savings and improved profit margins.

Project Proposal Report: Click Here

Activity 3: Initial Project Planning

Initial Project Planning involves outlining key objectives, defining scope, and identifying clustering methods for the food demand forecasting for food delivery company. 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.

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 food demand forecasting for food delivery companies 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

The dataset for "Food demand forecasting for food delivery company" is sourced from Kaggle. It includes order details like order_id, meal, category, cuisine, city_code, region_code. Data quality is ensured through thorough verification, addressing missing values, and maintaining adherence to ethical guidelines, establishing a reliable foundation for predictive modeling.

Data Collection Report: Click Here

Activity 2: Data Quality Report

The dataset for " Food demand forecasting for food delivery company " is sourced from Kaggle. It includes order details like order_id, meal, category, cuisine, city_code, region_code. Data quality is ensured through thorough verification, addressing missing values, and maintaining adherence to ethical guidelines, establishing a reliable foundation for predictive modelling.

Data Quality Report: Click Here

Activity 3: Data Exploration and Preprocessing

Data Exploration involves analyzing the food companies 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 food delivery prediction.

Data Exploration and Preprocessing Report: Click Here

Milestone 3: Model Development Phase

The Model Development Phase entails crafting a predictive model for food demand forecasting for food delivery company. It encompasses strategic feature selection, evaluating and selecting models (Kmeans), initiating training with code, and rigorously validating and assessing model performance for informed decisionmaking in the deliverying process.

Activity 1: Feature Selection Report

The Feature Selection Report outlines the rationale behind choosing specific features (e.g., order_id,cuisine,category,,region code,city code) for the customers data clustering model. It evaluates relevance, importance, and impact on predictive accuracy, ensuring the inclusion of key factors influencing the model's ability to discern the num_orders.

Feature Selection Report: Click Here

Activity 2: Model Selection Report

The Model Selection Report details the rationale behind choosing kmeans models for food delivery company. It considers each model's strengths in handling complex relationships, interpretability, adaptability, and overall predictive performance, ensuring an informed choice aligned with project objectives.

Model Selection Report: Click Here

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

The Initial Model Training Code employs selected algorithms on the orders dataset, setting the foundation for predictive modelling. The subsequent Model Validation and Evaluation Report rigorously assesses model performance, employing metrics like accuracy and precision to ensure reliability and effectiveness in predicting num of orders outcomes.

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 Kmeans clustering 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 Kmeans clustering algorithm. 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 Kmeans algorithm as the ultimate model. Its exceptional accuracy, ability to handle complexity, and successful hyperparameter tuning align with project objectives, ensuring optimal data clustering.

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

Project demonstration link : Click Here