To Predict Consumer Price Index

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: The objective of this project is to develop a predictive model for the Consumer Price Index (CPI) specifically targeting the food category. The CPI for food encompasses various subcategories including milk, cereals and pulses, meat, and fish. The accurate prediction of CPI for these subcategories is crucial for policymakers, businesses, and consumers as it helps in understanding inflation trends, making informed economic decisions, and planning budgets.

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Problem Statement Report:

Activity 2: Project Proposal (Proposed Solution)

The Consumer Price Index (CPI) is a key economic indicator that measures the average change in prices paid by consumers for goods and services over time. This project focuses on predicting the CPI for specific food categories: milk, cereals and pulses, meat, and fish. Accurate CPI predictions are vital for understanding inflation trends and making informed economic decisions. **Ref. template:** Click Here

To Predict Consumer Price Index Project Proposal Report :

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Activity 3: Initial Project Planning

Initial Project Planning involves outlining key objectives, defining scope, and identifying stakeholders for the CPI 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.

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Milestone 2: Data Collection and Preprocessing Phase

The Data Collection and Preprocessing Phase involves executing a plan to gather relevant CPI 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 "CPI" is sourced from public repositories. It includes physical measurements and biological data of Consumer Price Index. Data quality is ensured through thorough verification, addressing missing values, and maintaining adherence to ethical guidelines, establishing a reliable foundation for predictive modelling.

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Activity 2: Data Quality Report

The dataset for " To Predict Consumer Price Index " is sourced from public repositories. It includes physical measurements and biological data of CPI Data. Data quality is ensured through thorough verification, addressing missing values, and maintaining adherence to ethical guidelines, establishing a reliable foundation for predictive modelling. This report evaluates the quality of the data collected and preprocessed during the "Consumer Price Index" project. Ensuring high data quality is essential for accurate analysis and reliable conclusions.

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Activity 3: Data Exploration and Preprocessing

Data Exploration involves analysing the pumpkin seed dataset to understand patterns, distributions, and outliers. Preprocessing includes handling missing values, scaling, and encoding categorical variables. These crucial steps enhance the dataset's quality, ensuring it is ready for model training and testing phases.

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Milestone 3: Model Development Phase

The Model Development Phase entails crafting a predictive model for loan approval. It encompasses strategic feature selection, evaluating and selecting models (Random Forest, Decision Tree, Linear Regression), initiating training with code, and rigorously validating and assessing model performance for informed decision-making in the lending process.

Activity 1: Feature Selection Report

The Feature Selection Report outlines the rationale behind choosing specific features (e.g., food,meat,fish,cereals and pulses,milk etc) for the CPI prediction model. It evaluates relevance, importance, and impact on predictive accuracy, ensuring the inclusion of key factors influencing the model's ability to discern credible loan applicants.

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To Predict Consumer Price Index Feature Selection Report: [Click Here](#)

Activity 2: Model Selection Report

The Model Selection Report details the rationale behind choosing Random Forest, Decision Tree, Linear Regression models for loan approval prediction. 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

The Initial Model Training Code employs selected algorithms on the loan approval 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 loan outcomes.

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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: Hyperparameter Tuning Documentation

The Gradient Boosting Classifier 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 Classifier 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 Classifier as the ultimate model. Its exceptional accuracy, ability to handle complexity, and successful hyperparameter tuning align with project objectives, ensuring optimal loan approval predictions. **Ref. template: [Click Here](#)**

To Predict Consumer Price Index 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. They will need to explain their project and demonstrate its execution during the presentation.