

# Loan Sanction Amount Prediction Data With 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

**Problem Statement:** The early prediction of loan defaults can significantly improve financial outcomes, reduce risks for lenders, and enhance the financial health of borrowers. With the advent of big data, machine learning, and advanced analytics, there is a growing potential to predict loan defaults before they manifest. This predictive capability can aid in proactive financial planning, risk management, and personalized loan offerings. In the realm of finance, accurately predicting the likelihood of loan defaults is crucial for early intervention and improved financial stability. Despite advancements in financial technology and data analytics, current methods often lack precision and timeliness, leading to delayed decisions and suboptimal loan management. This project aims to develop a robust and scalable loan prediction model that leverages applicant data, including credit history, income, lifestyle factors, and real-time financial indicators, to forecast the likelihood of loan defaults with high accuracy. The goal is to enhance predictive capabilities, reduce financial risks, and ultimately improve financial decision-making through timely and personalized interventions.

**Loan Prediction Problem Statement Report:** <https://github.com/HEVANTH8/Loan-Sanction-Amount-Prediction-Data-With-ML/tree/master/2.Project%20Initialization%20and%20Planning%20Phase>

### Activity 2: Project Proposal (Proposed Solution)

This project proposal outlines a solution to address the problem of early loan default detection through machine learning. With a clear objective to develop a predictive model for assessing loan risk based on financial indicators, lifestyle factors, and historical data, the proposal defines the scope of the project, including data collection, model development, and deployment. The proposed solution details the approach to be used, key features of the model, and specifies the

resource requirements including hardware, software, and personnel. By creating an accurate and user-friendly tool, the project aims to enable proactive financial management and improve early loan default detection.

Loan Prediction 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..

Loan Prediction 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 various sources, 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 "Loan Prediction Using Machine Learning" is sourced from reliable financial data repositories. It includes data quality measures to ensure meticulous data curation and integrity for informed decision-making in every analysis and decision-making endeavor.

Loan Prediction Data Collection Report: [Click Here](#)

### **Activity 2: Data Quality Report**

The dataset for "Loan Prediction Using Machine Learning" includes data quality issues from the selected source, including severity levels and resolution plans. It will aid in systematically identifying and rectifying data discrepancies.

Loan Prediction Data Quality Report: [Click Here](#)

### **Activity 3: Data Exploration and Preprocessing**

Dataset variables will be statistically analyzed to identify patterns and outliers, with Python employed for preprocessing tasks like normalization and feature engineering. Data cleaning will address missing values and outliers, ensuring quality for subsequent analysis and modeling, and forming a strong foundation for insights and predictions.

**Loan Prediction Data Exploration and Preprocessing Report:** [Click Here](#)

## 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, KNN, SVC), 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 forthcoming update, each feature will be accompanied by a brief description. Users will indicate whether it's selected or not, providing reasoning for their decision. This process will streamline decision-making and enhance transparency in feature selection.

**Lo Prediction Feature Selection Report:** [Click Here](#)

### Activity 2: Initial Model Training Code, Model Validation and Evaluation Report

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

**Disease Prediction Model Development Phase Template:** [Click Here](#)

### Activity 3: Model Selection Report

The Model Selection Report details the rationale behind choosing Random Forest, Decision Tree, KNN, and SVC 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.

**Loan Prediction Model Selection Report:** [Click Here](#)

## Milestone 3: 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 [.clickhere](#)

### Activity 1: Hyperparameter Tuning Documentation

The knn 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 knn 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 knn as the ultimate model. Its exceptional accuracy, ability to handle complexity, and successful hyperparameter tuning align with project objectives, ensuring optimal loan approval predictions.

### Loan Prediction Model Optimization and Tuning Phase Report:

<https://github.com/HEVANTH8/Loan-Sanction-Amount-Prediction-Data-With-MI/tree/master/5.Model%20Optimization%20and%20Tuning%20Phase>

## Milestone 5: Project Files Submission and Documentation

For project file submission in Github, Kindly click the link and refer to the flow. <https://github.com/HEVANTH8/Loan-Sanction-Amount-Prediction-Data-With-MI>

For the documentation, Kindly refer to the link. <https://github.com/HEVANTH8/Loan-Sanction-Amount-Prediction-Data-With-MI/tree/master/7.Project%20Documentation%20and%20demonstration>

## **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. [clickhere](#)