Model Development Phase Template

Date	05 June 2024
Team ID	737568
Project Title	AutoForesight : A Predictive Model for Streamlining Car Loan Repayment Planning
Maximum Marks	6 Marks

Model Selection Report

In the forthcoming Model Selection Report, various models will be outlined, detailing their descriptions, hyperparameters, and performance metrics, including Accuracy or F1 Score. This comprehensive report will provide insights into the chosen models and their effectiveness.

Model Selection Report:

Model	Description	Hyperparameters	Performance Metric (e.g., Accuracy, F1 Score)
Random Forest	Random Forest Regressor emerged as a contender due to its ability to mitigate overfitting and handle noisy data. It is an ensemble method that combines multiple decision trees,	`(n_estimators=200, random_state=42)`	Accuracy - 99.8% F1 Score - 99.8%

	providing robust predictive accuracy. Random forests are less sensitive to outliers and noise compared to individual decision trees.		
K-Nearest Neighbors	KNN was assessed for its simplicity and intuitive approach. It makes predictions based on the average of the k-nearest neighbors in the feature space, without making strong assumptions about the underlying data distribution. KNN is suitable for capturing complex, non-linear relationships, especially in smaller datasets.	n_neighbors	Accuracy - 85.5% F1 Score – 87.3%

Gaussian NB	Gaussian Naive Bayes (Gaussian NB) is a simple yet effective probabilistic classifier that assumes features follow a normal distribution and are independent of each other. It uses Bayes' Theorem to calculate the probability of a data point belonging to each class based on these assumptions. Despite its simplicity, it's efficient and performs well in many applications like text classification and spam detection.		Accuracy – 54.4% F1 Score – 63.9%
Decision Tree Classifier	Simple tree structure;interpretable,captures non-linear relationships,suitable for initial insights into loan approval patterns.	`(criterion='entropy', random_state=0)`	Accuracy – 99.8% F1 Score – 80.1%