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November 14, 2024

1 Assignment #2

In this assignment, you will explore and develop a machine learning model to predict loan approvals. Using a dataset with socio-demographic and financial data, your goal is to analyze and understand the factors that influence loan approval and build a predictive model based on these insights.

Project Steps Loan Approval Prediction

1. **Dataset Loading**: Begin by loading the dataset, which includes various features that may impact loan approval outcomes.
2. **Exploratory Data Analysis (EDA)**: Analyze patterns and correlations within the data, considering factors like gender, marital status, education level, dependents, and income. Summarize these findings to reveal any initial insights about loan approval likelihood.
3. **Handling Missing Data**: Check for any missing values and apply techniques to handle these gaps, ensuring the dataset is ready for modeling.
4. **Data Encoding and Scaling**: Convert categorical data to numeric form through encoding, and normalize the feature values using MinMax scaling to improve model performance.
5. **Data Splitting**: Split the dataset into training and testing subsets to evaluate model accuracy.
6. **Model Training**: Train several machine learning models, including Logistic Regression, SVM (Support Vector Machine), Decision Tree, Random Forest, Naive Bayes, and K-Nearest Neighbors (KNN).
7. **Model Evaluation**: Measure the performance of each model using appropriate metrics, such as accuracy, precision, recall, or F1 score, to assess their effectiveness.
8. **Final Analysis and Model Selection**: Identify the best-performing model (in this case....), summarize your findings, and save the selected model.

Objective By completing this assignment, you will gain practical experience in data preprocessing, model training, and performance evaluation. You will also learn how to interpret the impact of different factors on loan approval and select the most accurate machine learning model for this purpose.

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