**Predictor Credit Card Approval Report**

**Introduction:**

Commercial banks receive numerous applications for credit cards on a daily basis. However, not all applications are approved due to various factors such as high loan balances, low income levels, or too many inquiries on an individual's credit report. Manual analysis of these applications is tedious, error-prone, and time-consuming. Therefore, many commercial banks have turned to machine learning techniques to automate the credit card approval process.

In this report, we will discuss the development of an automatic credit card approval predictor using machine learning techniques. We have been provided with a small subset of credit card applications as a Pandas DataFrame.

**Data Overview:**

The dataset contains information about credit card applications, including various attributes such as income levels, loan balances, and the number of inquiries on an individual's credit report. It also includes a target variable indicating whether an application was approved or rejected.

**Analysis:**

1. **Data Exploration:**
   * We started by exploring the dataset to understand its structure and characteristics.
   * Examined the distribution of the target variable (approval status) to understand the balance between approved and rejected applications.
   * Analyzed the distribution of other key variables to identify any patterns or anomalies.
2. **Data Preprocessing:**
   * Conducted data preprocessing steps such as handling missing values, encoding categorical variables, and scaling numerical features.
   * Split the dataset into training and testing sets to evaluate the performance of the machine learning model.
3. **Model Building:**
   * Experimented with various machine learning algorithms such as logistic regression, decision trees, and random forests.
   * Evaluated the performance of each model using appropriate evaluation metrics such as accuracy, precision, recall, and F1-score.
   * Tuned hyperparameters of selected models to improve performance further.
4. **Model Evaluation:**
   * Selected the best-performing model based on evaluation metrics and cross-validation results.
   * Generated a confusion matrix to visualize the model's performance in predicting credit card approvals and rejections.

**Results:**

The developed automatic credit card approval predictor achieved promising results with high accuracy and satisfactory precision and recall scores. The selected model demonstrated robust performance in predicting credit card approvals and rejections, providing valuable insights for the bank's decision-making process.

**Conclusion:**

In conclusion, the development of an automatic credit card approval predictor using machine learning techniques offers significant advantages for commercial banks. By automating the credit card approval process, banks can improve efficiency, reduce errors, and enhance customer satisfaction. However, continuous monitoring and refinement of the model are essential to ensure its effectiveness and adaptability to changing market conditions.

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