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Introduction

Predicting Credit Card Approvals

The goal of this project is to develop a machine learning-based credit card approval predictor. It involves analyzing credit card applications and determining whether an individual's application will be accepted.

About Me

- **Name**: Biyawala Viral Deven
- **Education**: Indian Institute of Information Technology ,
  Surat - 3rd Year
- **Learning**: Machine Learning Learner from DataCamp
- **Skills For Project**: Language: Python
  Data Analysis and Manipulation(Pandas)
  Handling Missing Value
  Machine Learning(Scikit-Learn)
  Model Evaluation
  Performance Metrics

Project Overview

- **Objective**: Develop a machine learning model to automate the credit card approval process by accurately predicting the approval or denial of credit card applications based on various applicant features.
- **Components**:
  - Inspecting the applications
  - Handling the missing values
  - Splitting the dataset into train and test sets
  - Fitting a logistic regression
  - Making predictions
- **Data Source**: Kaggle (Credit Card Approval Data)

Data Analysis Approach

- The credit card application dataset contains both numerical and non-numerical features.
- The dataset has missing values that need to be handled.
- Splitting the dataset into training and test sets is important for machine learning modeling.
- Missing values in numerical columns can be imputed using mean imputation.
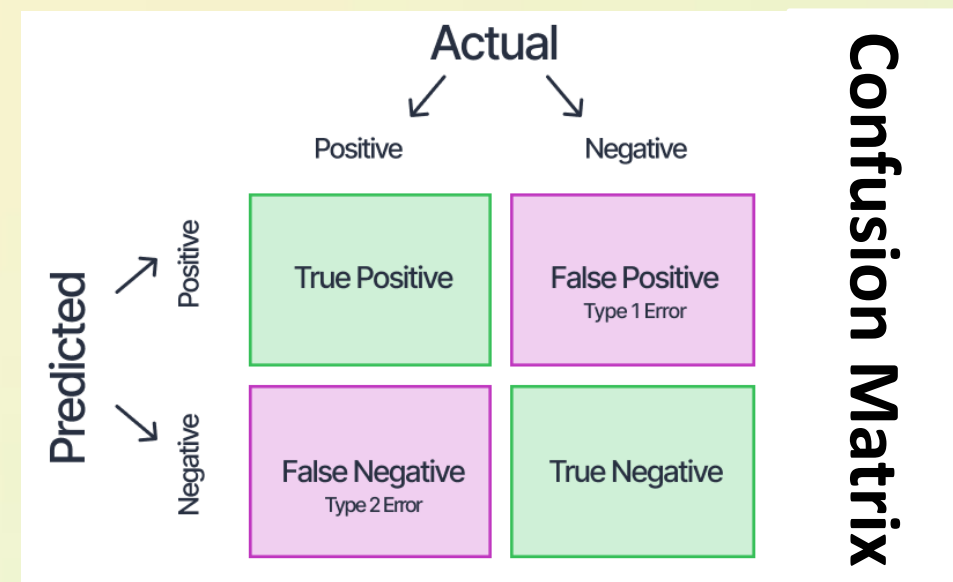- Missing values in non-numerical columns can be imputed with the most frequent values.

Data Analysis Approach

- Converting non-numeric data into numeric format is necessary for many machine learning models.
- Scaling the feature values to a uniform range improves model performance.
- Logistic regression is a suitable model for predicting credit card approvals.
- Evaluation metrics such as classification accuracy and confusion matrix can be used to assess model performance.

Results and Finding

- Scikit-learn is a popular machine learning library in Python.
- Handling null and missing values is important in data preprocessing.
- Missing values were imputed using mean imputation for numeric columns and mode imputation for non-numeric columns.
- The dataset was split into train and test sets for model training and evaluation.
- Grid search is a technique used to find the best hyperparameters for a machine learning model.
- Machine learning works well with numeric data.
- Model comparison should be done for better results.
- The performance of the model was evaluated using classification accuracy and the confusion matrix.

Visual Evidence

Conclusion

- Dr. Ignaz Semmelweis discovered the importance of handwashing in reducing deaths caused by childbed fever.
- The proportion of deaths was alarmingly high in the early 1840s at the Vienna General Hospital, with Clinic 1 experiencing higher mortality rates than Clinic 2.
- Semmelweis suspected that the contamination from the hands of medical students, who also worked in autopsy rooms, caused childbed fever.
- When handwashing was made mandatory, there was a significant reduction in the proportion of deaths.
- A bootstrap analysis estimated that handwashing reduced the proportion of deaths by around 8 percentage points.

Acknowledgments and Project Link

- **Acknowledgment to DataCamp**: I would like to express my gratitude to DataCamp for providing valuable courses and resources that have contributed to my learning journey and the completion of this project.
- **Acknowledgment to Kaggle**: I would like to acknowledge Kaggle for providing the dataset used in this project. The dataset from Kaggle has been instrumental in conducting the analysis and deriving meaningful insights.

To access the code and detailed documentation for this project, please visit the my GitHub repository by [Clicking Here](#)

Future Scope

- Application of machine learning for credit card application analysis, improving efficiency and accuracy.
- Use of machine learning to predict credit card approval status based on various factors and data points.
- Development of a machine learning model for predicting credit card approval, reducing the need for manual analysis and decision-making.
- The credit card approval predictor can be enhanced to detect fraud by analyzing patterns and anomalies in applications, improving security for financial institutions.
- The credit card approval predictor can be utilized for customer segmentation, enabling tailored marketing campaigns based on factors like income, age, education level,etc.