Credit Card Default Prediction

Architecture Design

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Document Version Control

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Contents

1. Introduction

1.1. What is Architecture Design?

The goal of Architecture Design (AD) is to give the internal design of the actual program code for the `Insurance Premium Prediction`. AD describes the class diagrams with the methods and relation between classes and program specification. It describes the modules so that the programmer can directly code the program from the document.

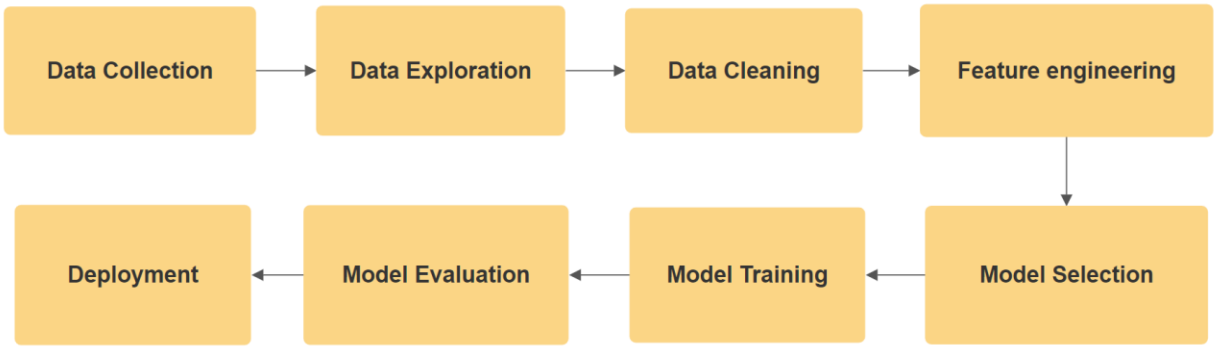
1.2. Scope

Architecture Design (AD) is a component-level design process that follows a step-by-step refinement process. This process can be used for designing data structures, required software, architecture, source code, and ultimately, performance algorithms. Overall, the data organization may be defined during requirement analysis and then refined during data design work. And the complete workflow.

1.3 Constraints

We only predict whether the credit card customer will default on the credit card bill next month or not.

2. Architecture



3. Architecture Description

3.1 Data Collection

Obtained relevant data from commercial banks, ensuring it includes information on credit card owner characteristics and payment history. This dataset contains information on default payments, demographic factors, credit data, history of payment, and bill statements of credit card clients in Taiwan from April 2005 to September 2005.

3.2 Data Exploration

Used descriptive statistics and visualizations to understand the distribution of key features. Identified potential correlations between features and the target variable (credit default).

3.3 Data Cleaning

Imputed missing values using appropriate techniques and instances with incomplete data are removed. Outliers are addressed through methods like trimming or transformation to maintain dataset integrity.

3.4 Feature Engineering

There are no categorical variables for Encoding and Numerical features are standardized to prepare the data for modeling.

3.5 Model Selection

Considering logistic regression, decision trees, random forests, and support vector machines. Suitable machine learning algorithms for classification tasks are selected. Experiments with different algorithms are done to identify the most effective approach.

3.6 Model Training

The dataset is split into a training set and test set for training the data to build the best model, after splitting the data the training data is trained with different classification algorithm to build the model for predicting the result.

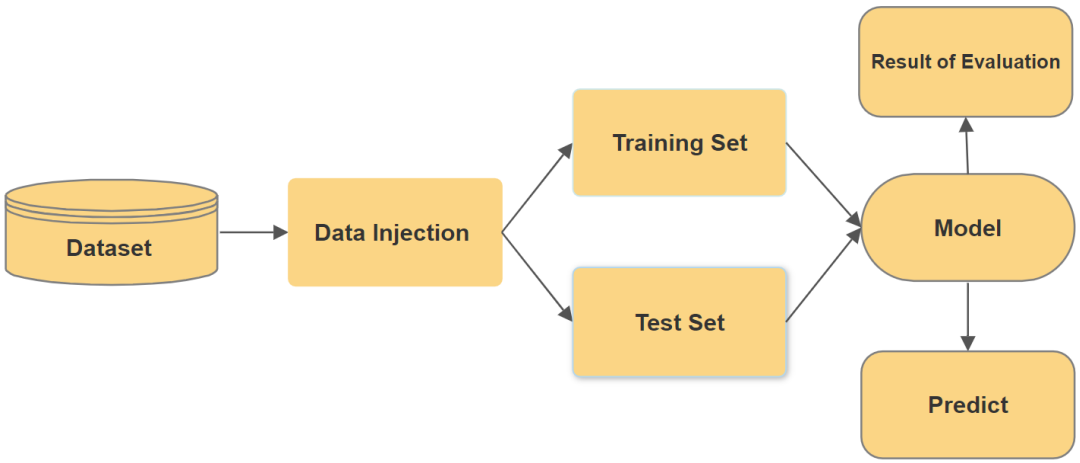
3.7 Model Evaluation

Evaluation of different classification model is done through the test dataset, and accuracy score is defined the accuracy score of the logistic regression is more among all the other models therefore the logistic regression is selected for predicting result.

3.8 Deployment

After saving the model, the API building process started using Flask. Web application creation was created in Flask for testing purposes. Whatever user will enter the data and then that data will be extracted by the model to estimate the premium of insurance, this is performed in this stage.

4. Architecture of Model Training



6. User Input / Output Workflow.