# Introduction

## What is a Low-Level Design Document?

The goal of LLD or a low-level design document is to give the internal logic of the actual program code for Metro Interstate Traffic Volume Prediction. It will explain the purpose and features of the system, the interfaces of the system, what the system will do, the constraints under which it must operate and how the system will react to external stimuli.

The main objective of the project is to predict if traffic volume is in high or low on a particular date. Weather circumstances, special days like holidays, daytime (morning, afternoon, night, etc.), temperature, a weekday, a numeric percentage of cloud cover are vital attributes for predicting traffic volume.

## Scope

Low-level design (LLD) 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.

# Technical Details

### Data Source

* Dataset: [Default of Credit Card Clients Dataset](https://www.kaggle.com/datasets/uciml/default-of-credit-card-clients-dataset)

### Data Structure

* **Features**: 'LIMIT\_BAL', 'SEX', 'EDUCATION', 'MARRIAGE', 'AGE', 'PAY\_0', 'PAY\_2', 'PAY\_3', 'PAY\_4', 'PAY\_5', 'PAY\_6', 'BILL\_AMT1', 'BILL\_AMT2', 'BILL\_AMT3', 'BILL\_AMT4', 'BILL\_AMT5', 'BILL\_AMT6', 'PAY\_AMT1', 'PAY\_AMT2', 'PAY\_AMT3', 'PAY\_AMT4', 'PAY\_AMT5', 'PAY\_AMT6'
* **Target**: 'default.payment.next.month'

### Data Preprocessing

1. Handle missing values.
2. Encode categorical variables.
3. Feature scaling.

### Model Details

* **Algorithm**: XGBoost Classifier
* **Performance**: 80% accuracy
* **Hyperparameters**: Optimized using Grid Search or similar techniques.

### Training and Evaluation

1. Split data into training and testing sets.
2. Train the model on the training set.
3. Evaluate model performance on the test set.