High-Level Design (HLD) Document

Project Title: Cryptocurrency Liquidity Prediction for Market Stability

Objective:

To predict 24h liquidity volume of cryptocurrencies using machine learning models based on historical price and market data.

System Overview:

This project uses a supervised machine learning pipeline to forecast liquidity levels. The main components are:

- Data Collection

- Preprocessing and Normalization

- Exploratory Data Analysis (EDA)

- Model Selection and Training

- Evaluation

- Model Export for Deployment

Technologies Used:

- Python

- Scikit-learn

- Pandas, NumPy

- Google Colab

- Streamlit (for future deployment)

Data Sources:

Historical cryptocurrency prices and trading volume datasets (2016-2017).

Low-Level Design (LLD) Document

Modules and Flow:

1. Data Ingestion:

  - Read CSV file using pandas

  - Check for nulls and clean

2. Feature Preparation:

  - Select features: price, 24h change, market cap

  - Normalize using StandardScaler

3. Target Engineering:

  - Use log transformation on target (24h volume)

4. Model Training:

  - Use Linear Regression and Random Forest

  - Evaluate using RMSE, MAE, R2

5. Model Export:

  - Save final model and scaler using pickle

6. Optional Deployment:

  - Load model in Streamlit app for live predictions

All steps are implemented in a Google Colab notebook and designed for reproducibility and clarity.