📌 2. HLD – High-Level Design Document

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1. System Overview

The system predicts **cryptocurrency liquidity_score** using historical market data and a trained ML model.

The architecture includes:

- Data Processing Pipeline
- Model Training Pipeline
- Streamlit Prediction App
- Reporting (PDF, CSV)
- Logging + History

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2. Components (High Level)

A. Data Layer

- Raw data from data/processed folder
- Engineered Features CSV
- Model (.pkl file)

B. ML Layer

- Linear Regression Model
- Training Script
- Evaluation & Feature Importance

C. Application Layer

- Streamlit UI
- Single + Batch Prediction
- Auto-fill from historical data
- PDF Generator
- CSV History Logger

D. User Interface

- Clean UI with:
    - Numeric inputs
    - Autofill by coin
    - Dark Mode
    - Help Panel (Floating)
    - Charts & Feature Importance

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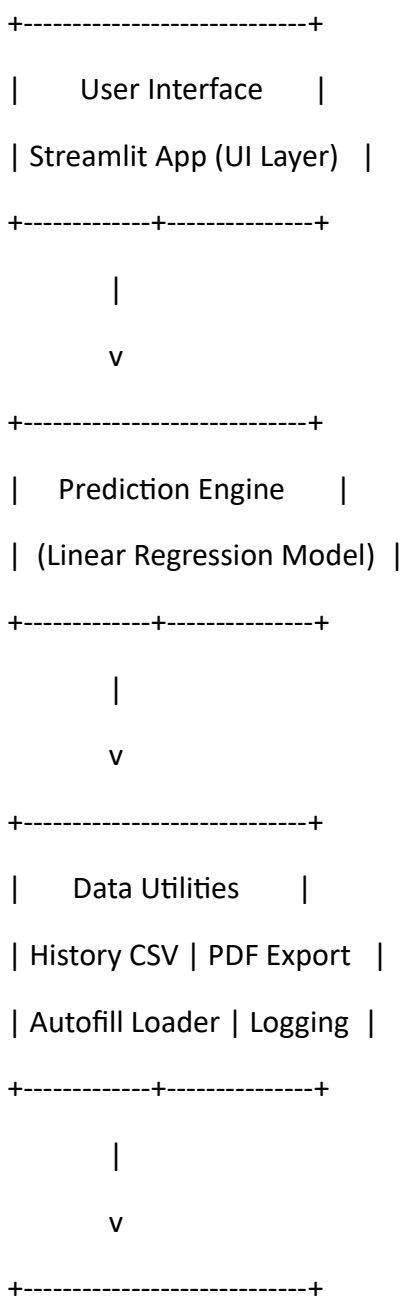
3. Architecture Diagram (Conceptual)



```
|       File System          |
| models/ | data/ | reports/  |
+----------------------------+
```

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4. Tech Stack

- **Python 3.10+**
- **Pandas**, **NumPy**
- **scikit-learn**
- **Streamlit**
- **Matplotlib**
- **ReportLab**
- **Joblib**

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5. Non-Functional Requirements

- High responsiveness
- User-friendly UI
- Reproducible predictions
- Light & Dark themes
- Logs for debugging
- Exportable reports