**Database Schema Setup**

**1. Stocks (Master Table)**

**Stores core information about each stock.**

* **stock\_id (Primary Key, INTEGER, AUTOINCREMENT)**
* **ticker (VARCHAR, Unique)**
* **company\_name (TEXT)**
* **industry (TEXT)**
* **sector (TEXT)**
* **country (TEXT)**

**2. Fundamental Data Table**

**Stores fundamental metrics.**

* **stock\_id (Foreign Key → Stocks)**
* **date (DATE)**
* **market\_cap (FLOAT)**
* **ev\_ebitda (FLOAT)**
* **pe\_ratio (FLOAT)**
* **peg\_ratio (FLOAT)**
* **croci (FLOAT)**
* **revenue\_cagr (FLOAT)**
* **dividend\_growth\_rate (FLOAT)**

**3. Price Data Table**

**Historical price data for stocks (OHLC format).**

* **stock\_id (Foreign Key → Stocks)**
* **date (DATE)**
* **open\_price (FLOAT)**
* **high\_price (FLOAT)**
* **low\_price (FLOAT)**
* **close\_price (FLOAT)**
* **adjusted\_close (FLOAT)**
* **volume (INTEGER)**

**4. Technical Indicators Table**

**Stores computed technical indicators (e.g., ATR).**

* **stock\_id (Foreign Key → Stocks)**
* **date (DATE)**
* **atr (FLOAT)**
* **moving\_average\_50 (FLOAT)**
* **moving\_average\_200 (FLOAT)**
* **macd (FLOAT)**

**5. Risk Metrics Table**

**Stores risk-adjusted metrics like Sortino and Alpha.**

* **stock\_id (Foreign Key → Stocks)**
* **date (DATE)**
* **fama\_french\_alpha (FLOAT)**
* **sortino\_ratio (FLOAT)**

**6. Scoring System Table**

**Stores calculated scores for ranking stocks.**

* **stock\_id (Foreign Key → Stocks)**
* **date (DATE)**
* **fundamental\_score (FLOAT)**
* **technical\_score (FLOAT)**
* **risk\_adjusted\_score (FLOAT)**
* **overall\_score (FLOAT, Normalised score)**

**7. Portfolio Allocation Table**

**Stores calculated portfolio weights from mean-variance or Kelly criterion.**

* **stock\_id (Foreign Key → Stocks)**
* **allocation\_date (DATE)**
* **allocation\_weight (FLOAT)**
* **method (VARCHAR) (e.g., "Markowitz", "Kelly Criterion")**

**8. Price Prediction Results Table**

**Stores forecasts generated by ARIMA/LSTM models.**

* **stock\_id (Foreign Key → Stocks)**
* **forecast\_date (DATE)**
* **model\_type (VARCHAR) (e.g., "ARIMA", "LSTM")**
* **predicted\_price (FLOAT)**
* **confidence\_interval\_upper (FLOAT)**
* **confidence\_interval\_lower (FLOAT)**

**9. Risk Management Table**

**Stores stop loss and take profit data.**

* **stock\_id (Foreign Key → Stocks)**
* **strategy\_date (DATE)**
* **stop\_loss\_level (FLOAT)**
* **take\_profit\_level (FLOAT)**
* **atr (FLOAT) (for calculating dynamic stop-loss levels)**

**10. Portfolio Performance & Backtesting Table**

**Stores backtesting results and portfolio metrics.**

* **portfolio\_date (DATE)**
* **portfolio\_return (FLOAT)**
* **portfolio\_volatility (FLOAT)**
* **sharpe\_ratio (FLOAT)**
* **sortino\_ratio (FLOAT)**
* **benchmark\_return (FLOAT)**
* **benchmark (VARCHAR, e.g., "S&P 500")**

**11. Log Table**

**Captures logging information.**

* **log\_id (AUTO\_INCREMENT, Primary Key)**
* **timestamp (TIMESTAMP)**
* **module (VARCHAR, e.g., "data\_fetch", "model\_training")**
* **log\_level (VARCHAR, e.g., "INFO", "WARNING", "ERROR")**
* **message (TEXT)**

**12. Raw API Responses Table (New Addition)**

**Stores raw API responses to avoid redundant requests.**

* **response\_id (Primary Key, AUTOINCREMENT)**
* **stock\_id (Foreign Key → Stocks)**
* **date (DATE)**
* **api\_name (VARCHAR, e.g., "Yahoo Finance", "Alpha Vantage")**
* **response (JSON) (Stores raw API data for future use)**