Fundamentals of Software Engineering

Crypto Trading Analytics & Risk Management App (CryptoAnalyticsPro)

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Deliverable # 2

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CryptoAnalyticsPro

A Crypto Trading Analytics & Risk Management App

Link to our Github Repository:
https://github.com/ammarhassan6/CryptoAnalyticsPro

Introduction

CryptoAnalyticsPro is a Windows-based desktop application designed for cryptocurrency traders to track their trade history, assess risk, and analyze profits and losses with real-time market data. Built using C# WinForms and MS Access for data storage, the application provides traders with a user-friendly interface for portfolio management, trade insights, and analyse market trend..

With the volatile nature of the cryptocurrency market, traders need robust tools to make informed decisions. CryptoAnalyticsPro offers essential features such as profit/loss tracking, stop-loss and take-profit calculations, risk assessment dashboards, and multi-currency portfolio valuation. The application aims to help traders minimize risks and maximize returns by offering actionable insights and historical trade analysis.

This project is ideal for traders who want a lightweight, standalone, and offline-capable trading analytics tool without relying on cloud-based solutions. The use of MS Access as a database allows seamless data management without complex setup requirements, making it accessible to beginner and advanced traders alike.

Note: During this iteration, we focused on redesigning parts of our app to improve the visual experience. We revised the layout, brainstormed new ideas, and made strategic changes by removing certain features and introducing new ones.

User Stories and Sub-User Stories

1. **Functional Portfolio Dashboard**

    - **User Story:** *As a trader, I want to analyze my portfolio to make informed decisions.*
    - **Sub-Stories:**
        - Display visual indicators of risk metrics (e.g., volatility, profit-loss asset concentration).
        - Show historical performance trends of the portfolio.
        - Categorize assets.

2. **Stop-Loss & Take-Profit Calculator**

    - **User Story:** *As a trader, I want to set stop-loss and take-profit levels to automate my trade exits.*
    - **Sub-Stories:**
        - Allow users to enter current price, stop-loss %, and take-profit %.
        - Calculate and display stop-loss and take-profit target values.
        - Display potential loss and potential profit based upon these percentages.
        - Allow saving of calculated thresholds for later use.

3. **Price Alerts**

    - **User Story:** *As a trader, I want to receive price alerts when a cryptocurrency reaches a specific value.*

    - **Sub-Stories:**
        - Let users select a cryptocurrency and set a price threshold.
        - Store alerts in the database for active monitoring.
        - Notify the user when the set price is hit.
        - Allow editing or deleting of alerts.

Structured Specifications

1. **Dashboard – Analyze Portfolio**
    - **Precondition:** User has a populated portfolio.
    - **Input:** None (auto-fetch data from portfolio and trade history).
    - **Processing:** Analyze asset performance and volatility.
    - **Output:** Dashboard showing total assets value, visual charts, and profit/loss amount.

2. **Stop-Loss & Take-Profit – Calculate Thresholds**
    - **Precondition:** User is logged in and provides asset data.
    - **Input:**
        - Coin Name
        - Desired stop-loss %
        - Desired take-profit %
    - **Processing:**
        - Calculate stop-loss and take-profit price points.
        - Calculate potential loss and profit.
        - Calculate risk/reward ratio.
        - Validate input ranges and suggest values if needed.
    - **Output:**
        - Display calculated price thresholds.
        - Option to save or link with portfolio items.

3. **Price Alerts – Configure and Notify**

    - **Precondition:** API price feed is active..

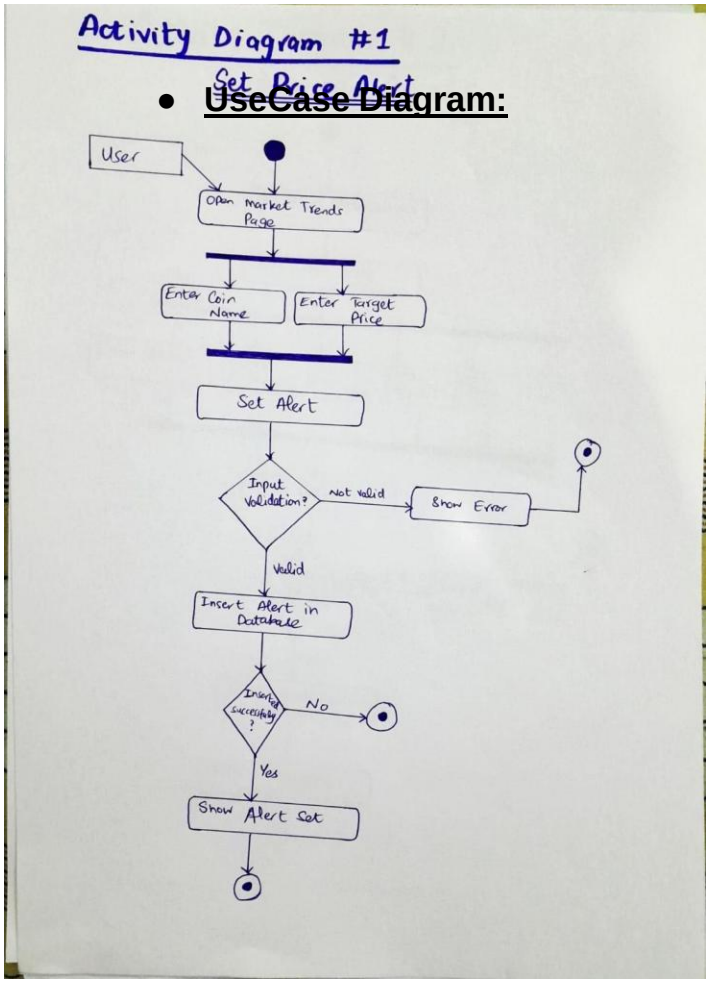
    - **Input:**
        - Selected cryptocurrency.
        - Desired alert price

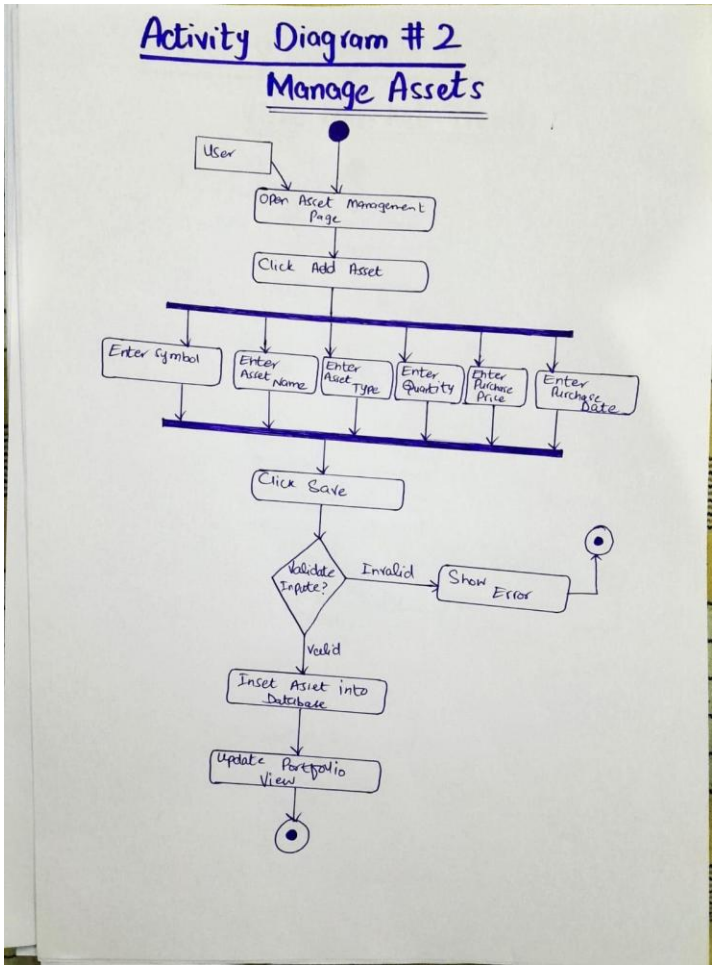
    - **Processing:**
        - Monitor live price via API.
        - Compare current price with alert thresholds.

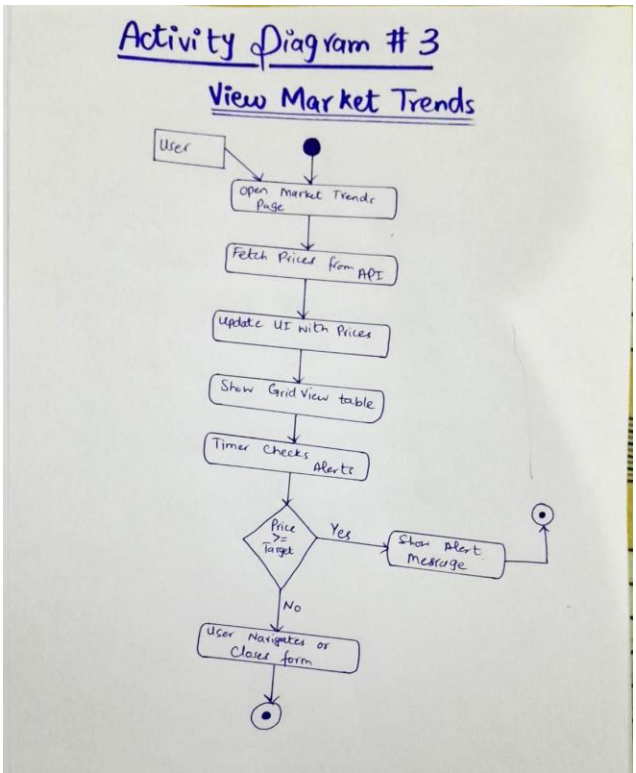
    - **Output:**
        - Notify the user when the alert condition is met.
        - Show alert status in the alert center.

DesignDiagrams:

- **Activity Diagram**

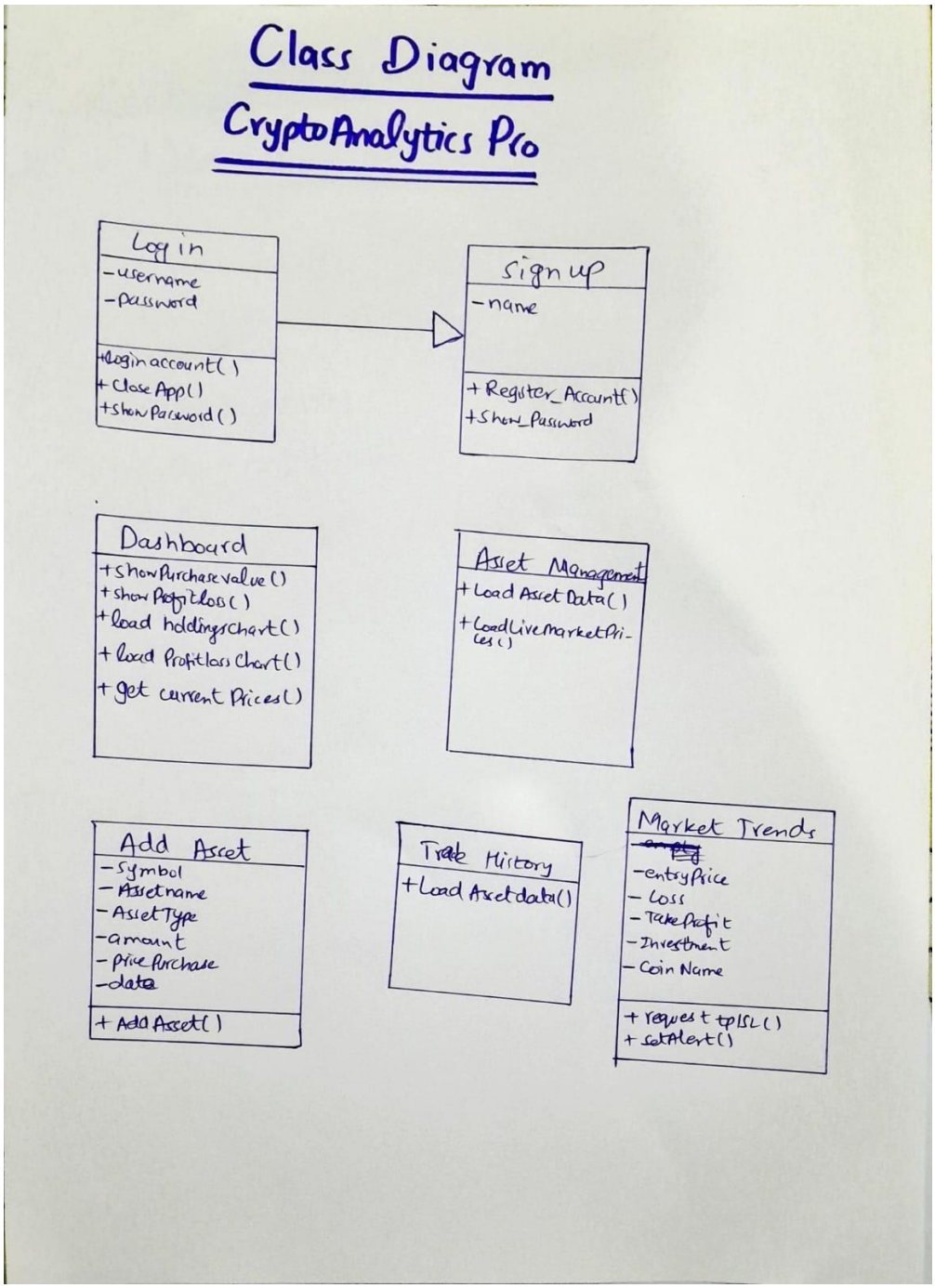




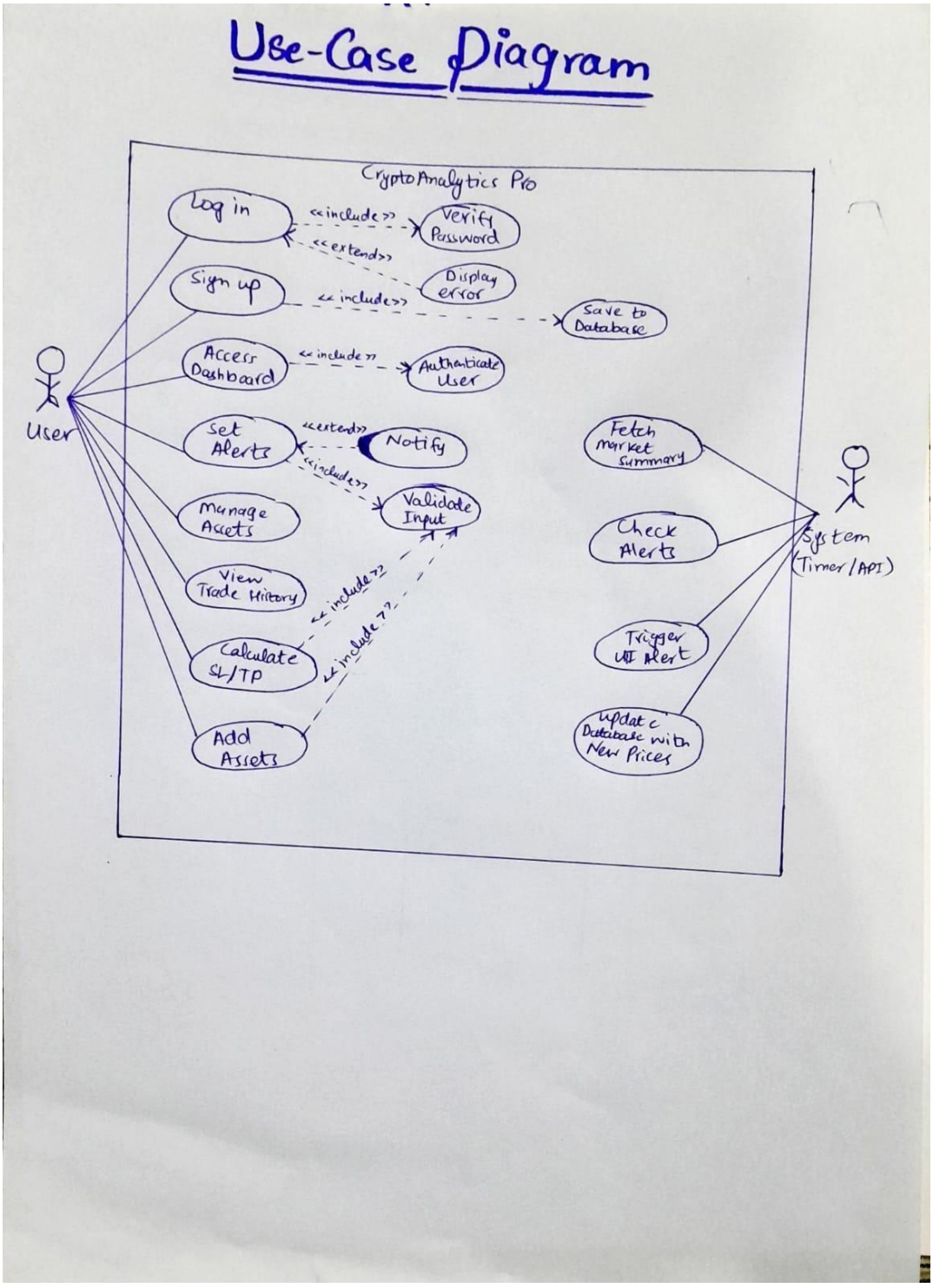


- ~~**UseCase Diagram:**~~

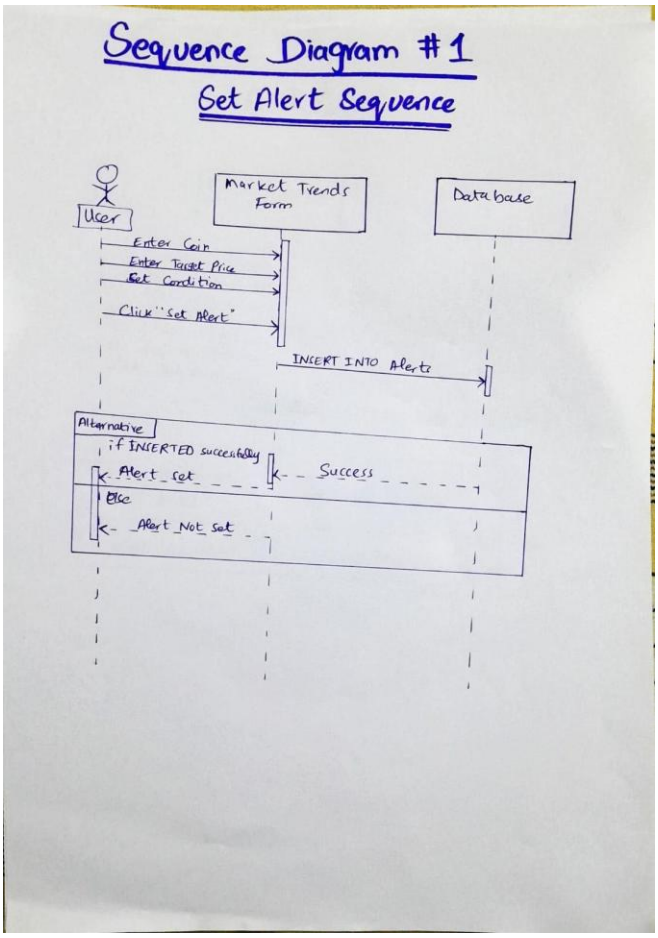
- **Class Diagram:**

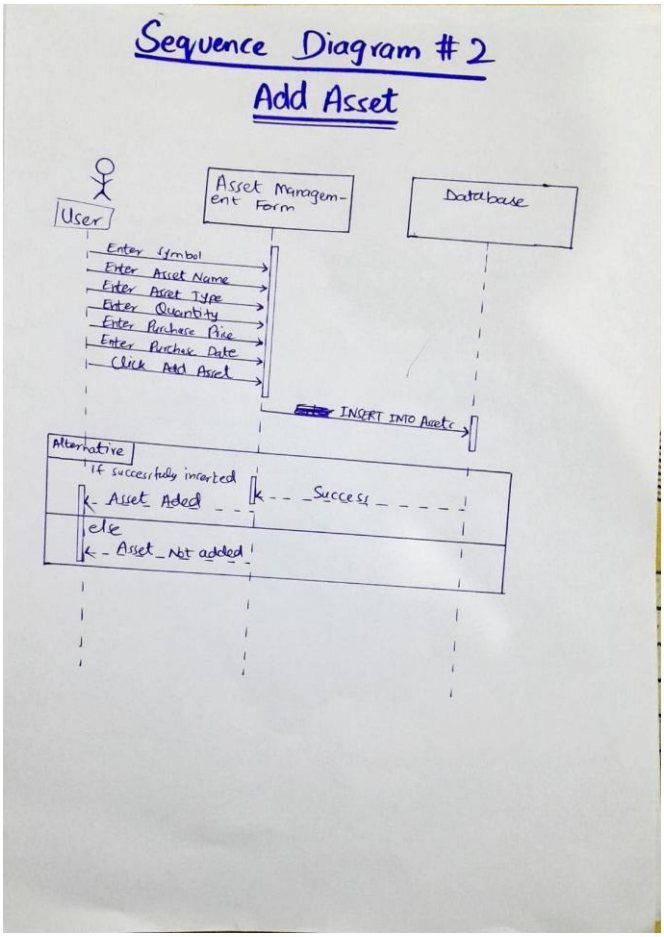


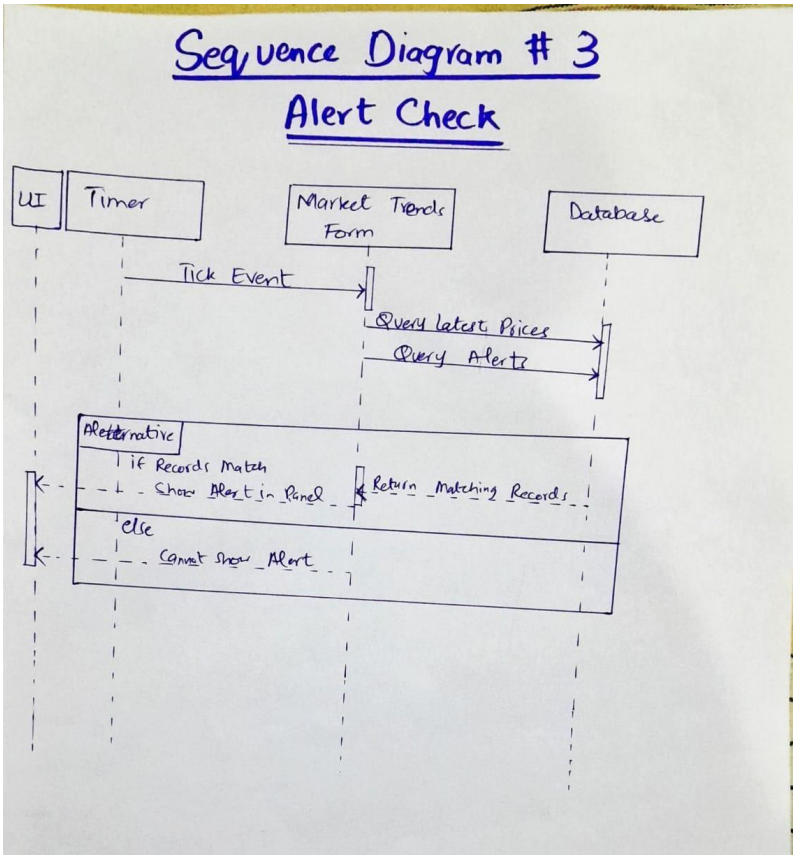
- **UseCase Diagram**



- **Sequence Diagram**



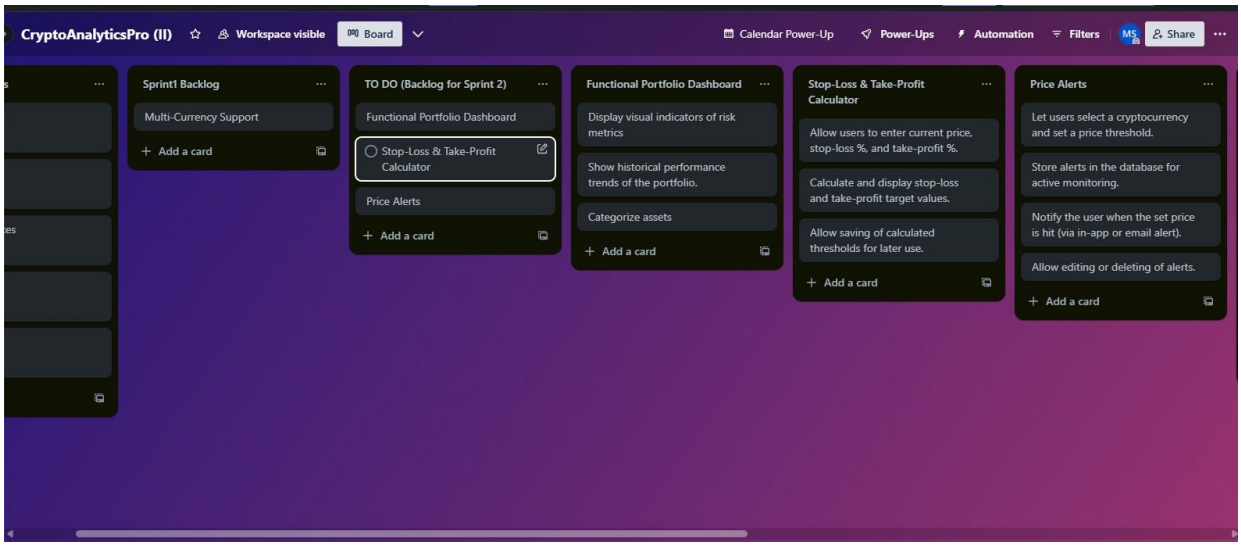




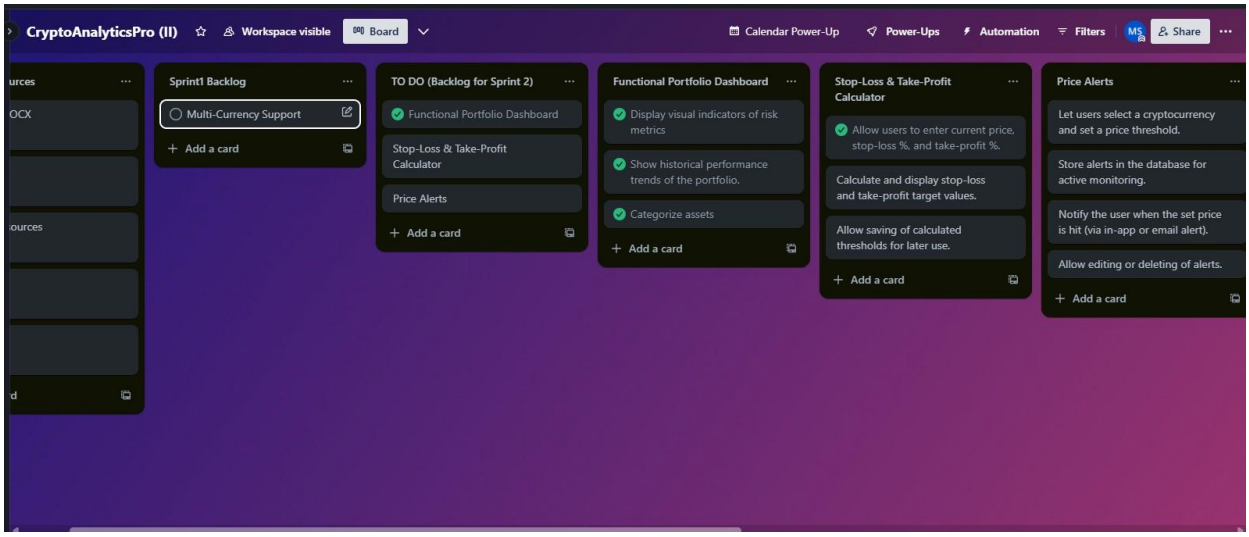
Scrum Board

Link to our Scrum Board: https://trello.com/b/yZkAkWpz/cryptoanalyticspro-ii

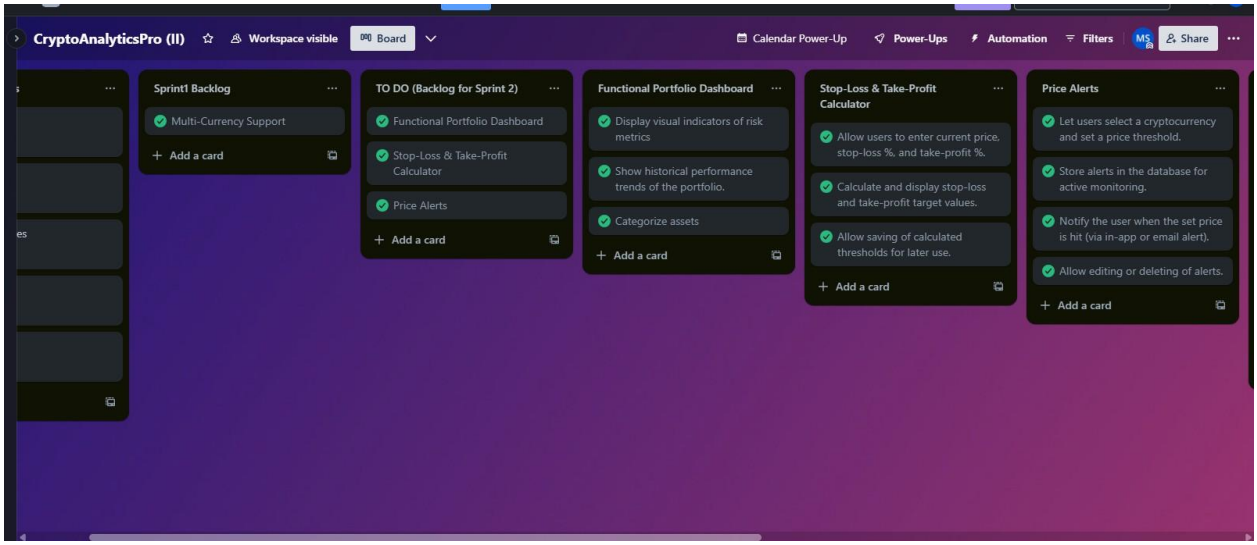
At Start:



At Mid:



At End:



Work Division:

Ali Saleem – Dashboard & Risk Analysis Lead

Responsibilities:

- Design and implement the **Risk Analysis Dashboard UI** (charts, graphs, indicators).
- Develop logic to calculate risk levels (e.g., volatility, diversification, historical trends).
- Integrate dashboard with existing portfolio data.
- Conduct basic data validation and test with mock data.

Hamza Mumtaz – Stop-Loss & Take-Profit Module

Responsibilities:

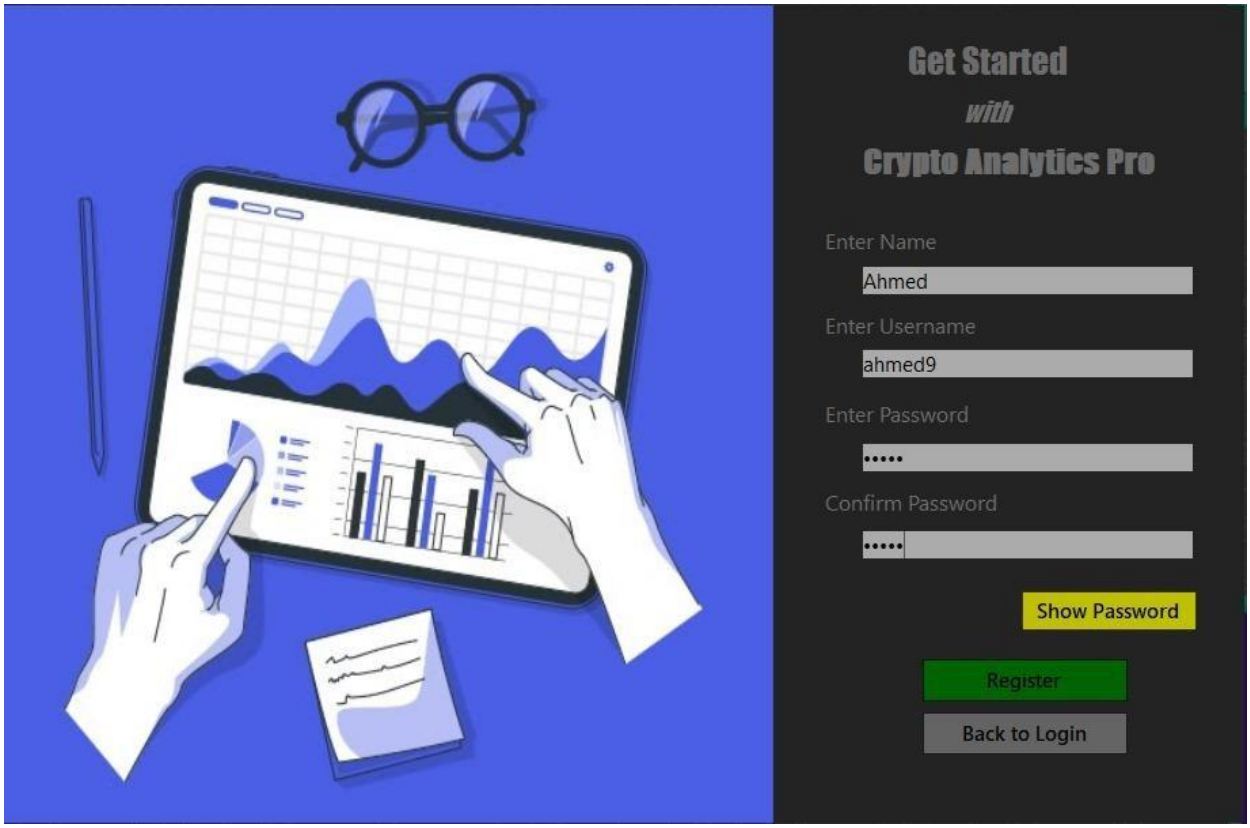
- Create the **Stop-Loss/Take-Profit calculator UI**.
- Implement logic for percentage-based threshold calculations.
- Add ability to save thresholds and optionally suggest based on past trades.
- Coordinate with others for portfolio context data, if needed.

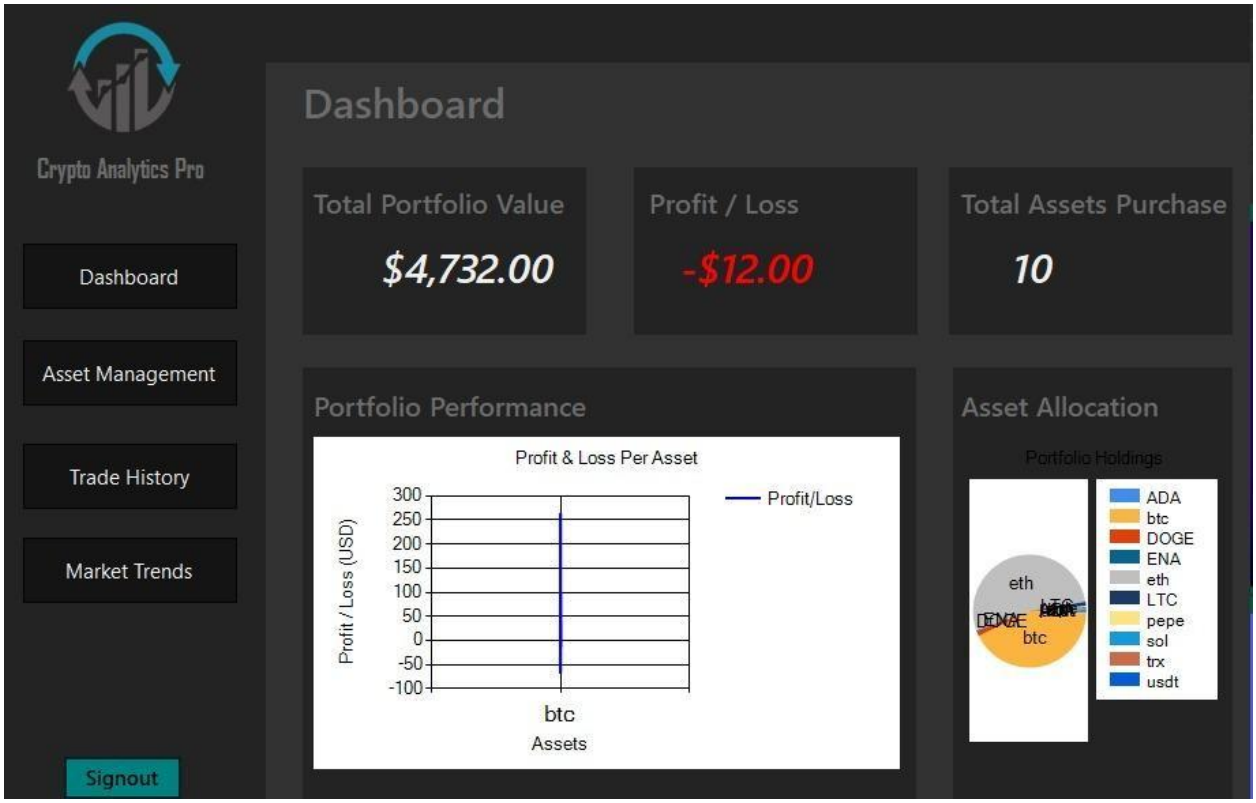
Ammar Hassan – Price Alerts System

Responsibilities:

- Design the **Price Alert configuration interface**.
- Implement logic to monitor real-time prices via API.
- Develop the alert notification system (e.g., modal popup or email).
- Add options to edit/delete active alerts.

Implementation:


Get Started
with
Crypto Analytics Pro
Enter Name
Ahmed
Enter Username
ahmed9
Enter Password
Confirm Password
Show Password
Register
Back to Login


Crypto Analytics Pro
Dashboard
Dashboard
Asset Management
Trade History
Market Trends
Signout
Total Portfolio Value
$4,732.00
Profit / Loss
-$12.00
Total Assets Purchase
10
Portfolio Performance
Profit & Loss Per Asset
Profit/Loss
Profit / Loss (USD)
300
250
200
150
100
50
0
-50
-100
btc
Assets
Asset Allocation
Portfolio Holdings
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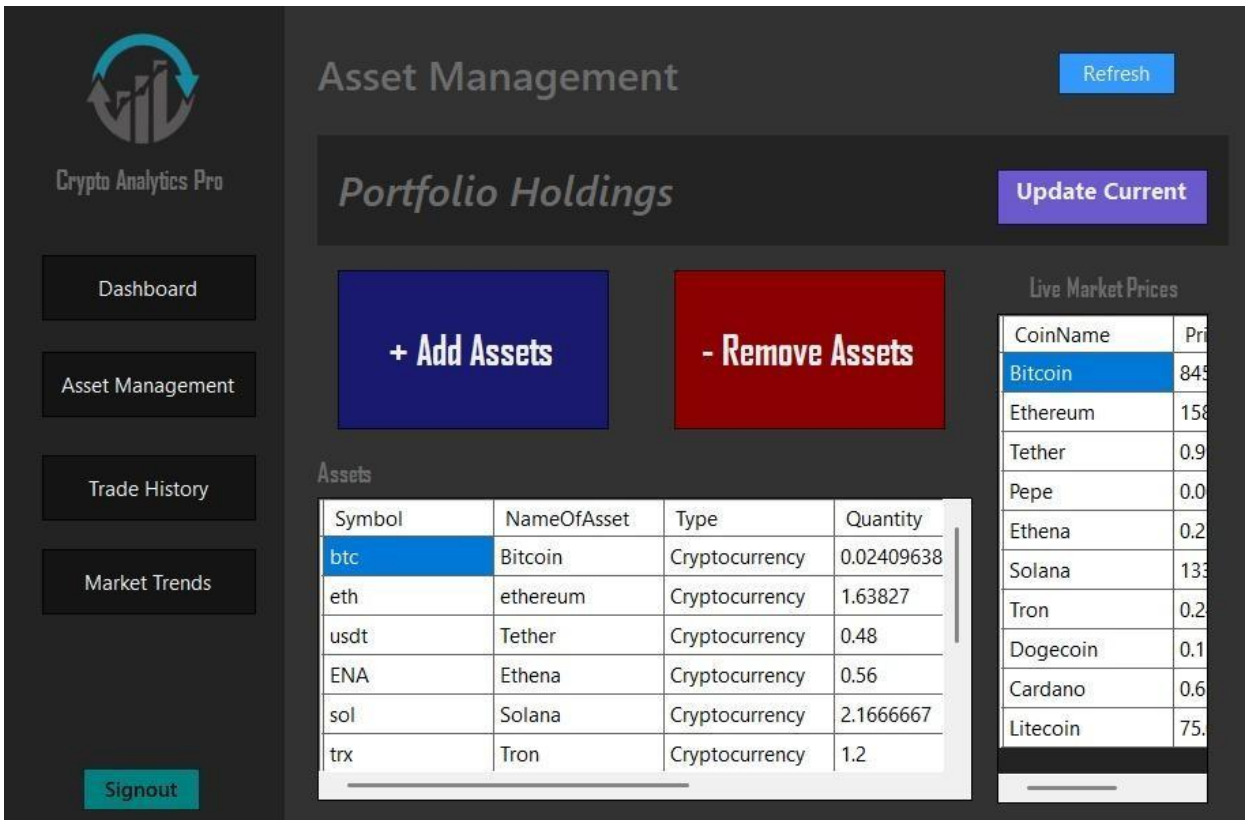
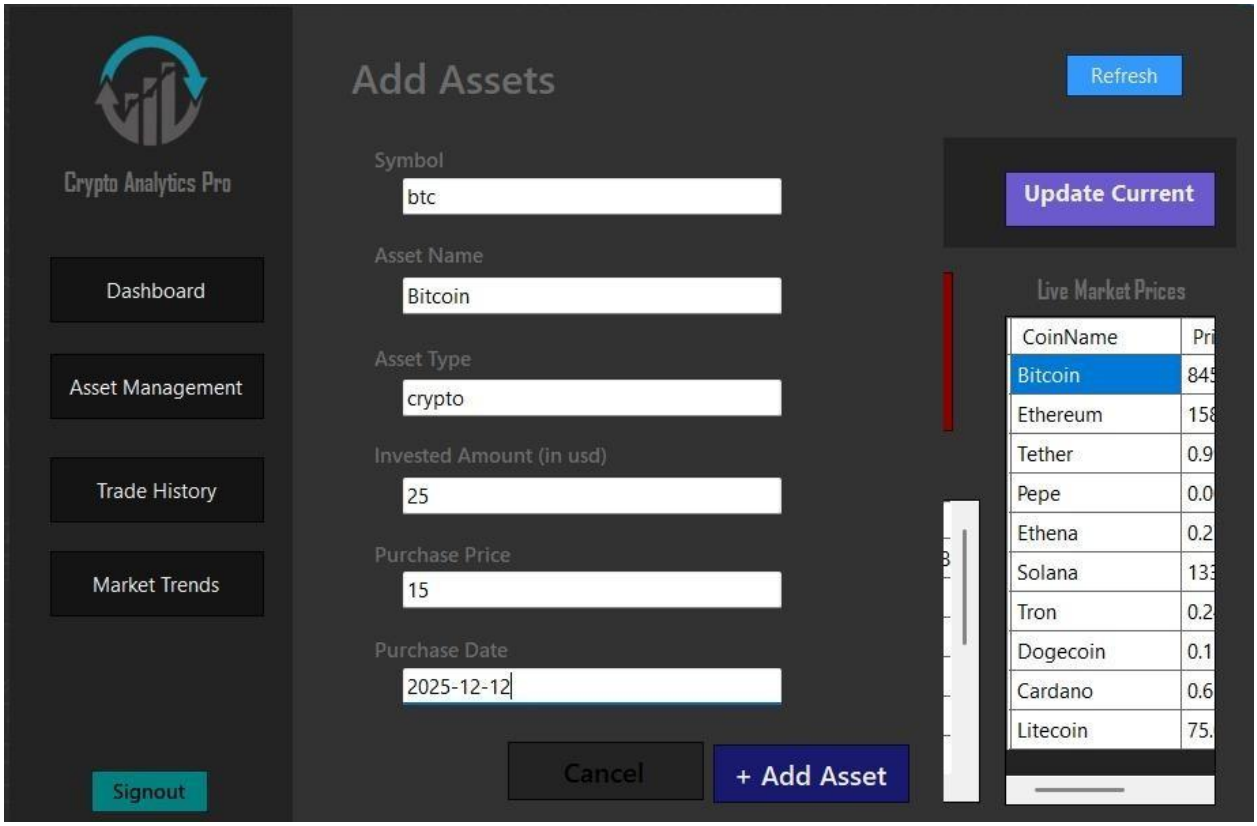
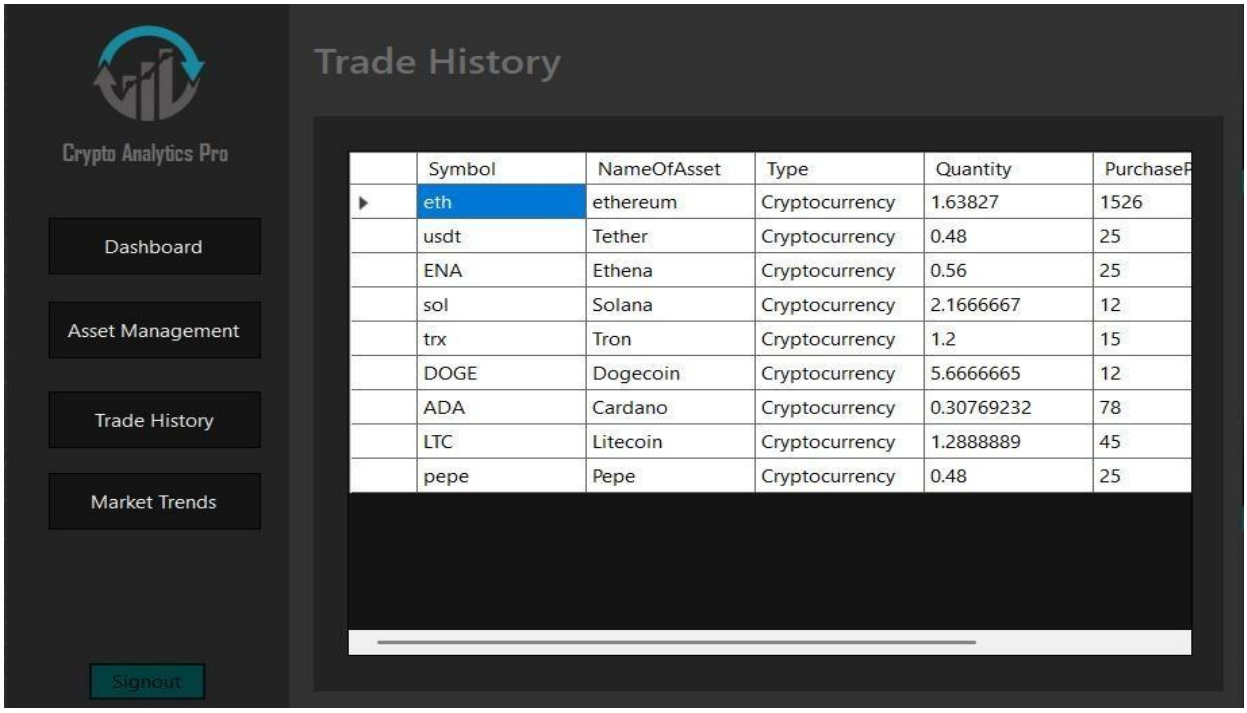
btc
ADA
btc
DOGE
ENA
eth
LTC
pepe
sol
trx
usdt


Crypto Analytics Pro
Dashboard
Asset Management
Trade History
Market Trends
Signout
Asset Management
Refresh
Portfolio Holdings
Update Current
+ Add Assets
- Remove Assets
Assets
Symbol | NameOfAsset | Type | Quantity
btc | Bitcoin | Cryptocurrency | 0.02409638
eth | ethereum | Cryptocurrency | 1.63827
usdt | Tether | Cryptocurrency | 0.48
ENA | Ethena | Cryptocurrency | 0.56
sol | Solana | Cryptocurrency | 2.1666667
trx | Tron | Cryptocurrency | 1.2
Live Market Prices
CoinName | Pri
Bitcoin | 845
Ethereum | 158
Tether | 0.9
Pepe | 0.0
Ethena | 0.2
Solana | 133
Tron | 0.2
Dogecoin | 0.1
Cardano | 0.6
Litecoin | 75.


Crypto Analytics Pro
Dashboard
Asset Management
Trade History
Market Trends
Signout
Add Assets
Refresh
Symbol
btc
Asset Name
Bitcoin
Asset Type
crypto
Invested Amount (in usd)
25
Purchase Price
15
Purchase Date
2025-12-12
Cancel
+ Add Asset
Update Current
Live Market Prices
CoinName
Bitcoin
Ethereum
Tether
Pepe
Ethena
Solana
Tron
Dogecoin
Cardano
Litecoin


Crypto Analytics Pro
Dashboard
Asset Management
Trade History
Market Trends
Signout
Trade History
Symbol
NameOfAsset
Type
Quantity
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ethereum
Cryptocurrency
1.63827
1526
usdt
Tether
Cryptocurrency
0.48
25
ENA
Ethena
Cryptocurrency
0.56
25
sol
Solana
Cryptocurrency
2.1666667
12
trx
Tron
Cryptocurrency
1.2
15
DOGE
Dogecoin
Cryptocurrency
5.6666665
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Cardano
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Cryptocurrency
0.48
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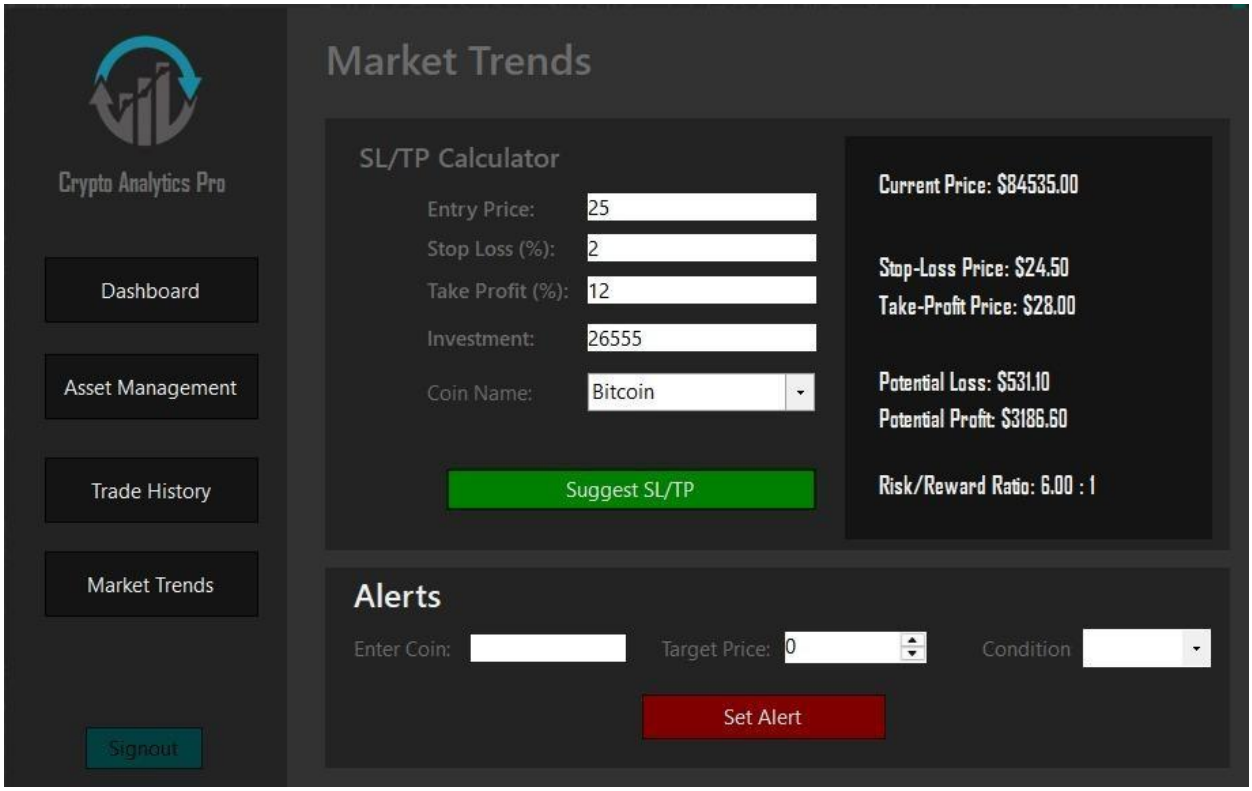
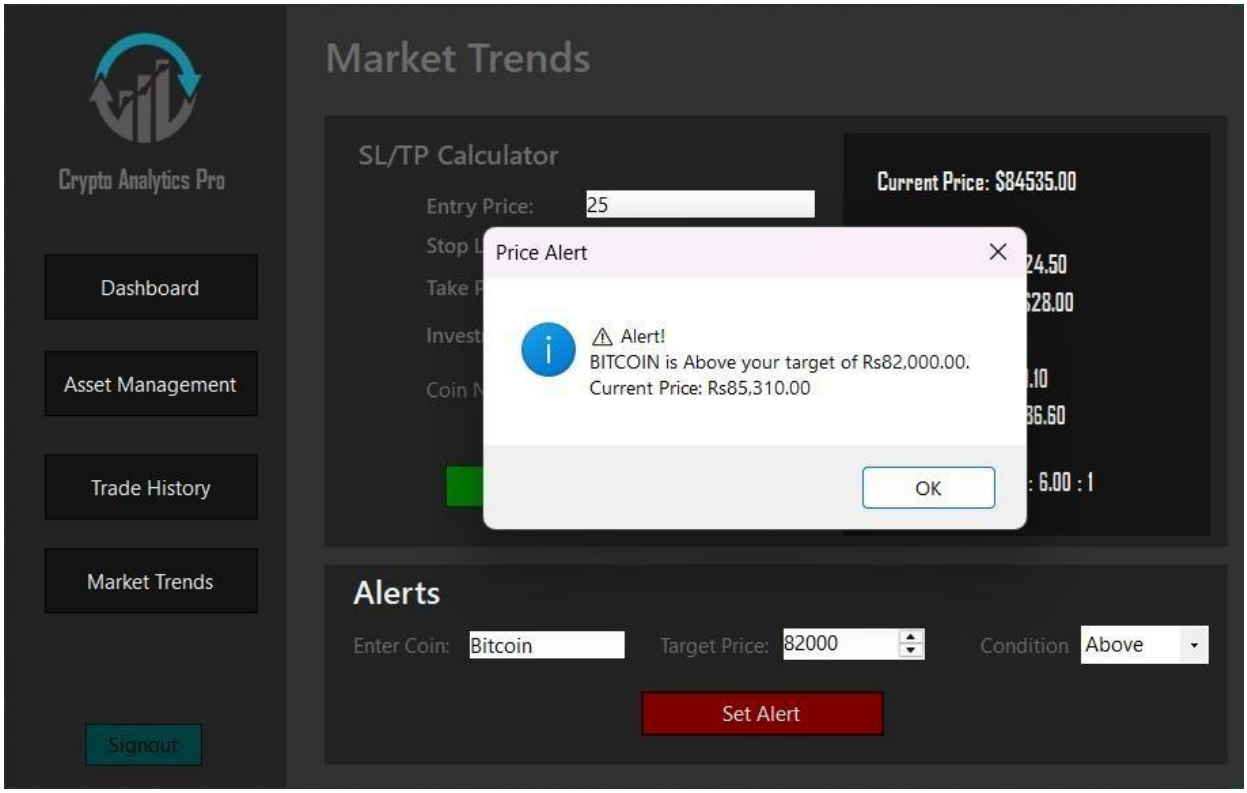

Crypto Analytics Pro
Dashboard
Asset Management
Trade History
Market Trends
Signout
Market Trends
SL/TP Calculator
Entry Price: 25
Stop Loss (%): 2
Take Profit (%): 12
Investment: 26555
Coin Name: Bitcoin
Suggest SL/TP
Current Price: $84535.00
Stop-Loss Price: $24.50
Take-Profit Price: $28.00
Potential Loss: $531.10
Potential Profit: $3186.60
Risk/Reward Ratio: 6.00 : 1
Alerts
Enter Coin:
Target Price: 0
Condition
Set Alert


Crypto Analytics Pro
Dashboard
Asset Management
Trade History
Market Trends
Signout
Market Trends
SL/TP Calculator
Entry Price: 25
Current Price: $84535.00
Price Alert
⚠ Alert!
BITCOIN is Above your target of Rs82,000.00.
Current Price: Rs85,310.00
OK
Alerts
Enter Coin: Bitcoin
Target Price: 82000
Condition Above
Set Alert