

# Project Analysis

## Binance Futures Trading Bot

### 1. Project Overview

The Binance Futures Trading Bot is an interactive Python application for executing trading strategies on Binance Futures testnet. It supports market orders, limit orders, Stop Limit and grid orders.

The bot is designed for **robustness, interactivity, and asynchronous execution**, allowing commands to run without waiting for previous operations to complete.

### 2. Key Features

#### 2.1. Interactive CLI Menu

- Continuous trading loop until Ctrl+C or quit command given
- Commands: market, limit, oco, stopl, grid, price, balance, help, quit
- Input validation and clear error messages

#### 2.2. Supported Order Types

- **Market Orders:** Execute at current market price
- **Limit Orders:** Execute at a specified price
- **STOP Limit:** Triggers a limit order when a specified stop price is reached.
- **TWAP Orders:** Execute large orders over time slices
- **Grid Orders:** Series of pre-defined buy/sell orders

#### 2.3. Balance Tracking

- Real-time balances of assets
- Handles missing asset errors or API failures gracefully

#### 2.4. Async Support

- Long-running orders do not block the CLI
- Uses `asyncio.create_task()` for non-blocking execution

## 2.5. Error Handling

- Validation for symbols, quantities, order parameters
- Custom logging for exceptions and API errors

## 3. Technical Stack

Component	Technology / Library
Programming Language	Python 3.11+
Async Execution	Python asyncio
Binance API Client	python-binance
Logging	Python logging

## 4. Project Structure

project\_root/

```
|
|
|└─ src/
|  |└─ bot.py          # Main bot client and API wrapper
|  |└─ utils.py        # API key loader and helpers
|  |└─ advanced/
|  |  |└─ Advanced.py  #Extends bot.py for advanced feature
|  |└─ runme.py        # Interactive CLI runner
|  └─ README.md        # Project overview
|  └─ .env              # To store API Keys and Secret
└─ .venv/              # Python virtual environment
```

## 5. CLI & Log Overview

### 5.1 CLI Execution

```
(.venv) Z:\Projectss\Freelance\Intern_assesment>python runme.py
🔥 Binance Futures CLI (type 'help' or number for commands, 'quit' to exit)

===== Binance Futures CLI =====
Pick a command by typing its number or name:

1. market - Place a market order
2. limit  - Place a limit order
3. grid   - Place a grid/OCO emulated order
4. stopl  - Place a stop limit order
5. price  - Check price of coin
6. balance - Check asset balance
7. help   - Show this menu
8. quit   - Exit the CLI
=====

>> balance usdt
Balance USDT: 13779.07695824
>> price btc
>> price btcusdt
Price of BTCUSDT: 113061.66
>> market btcusdt buy 0.01
Initiated transaction check logs for details
```

### 5.2 Log File

```
positionSide': 'BOTH', 'stopPrice': '0.00', 'workingType': 'CONTRACT_PRICE', 'priceProtect': False, 'origType': 'MARKET', 'priceMatch': 'NONE',
'selfTradePreventionMode': 'EXPIRE_MAKER', 'goodTillDate': 0, 'updateTime': 1758707640628}
2025-09-24 15:52:46,826 [ERROR] Handel_command func APIError(code=-1100): Illegal characters found in parameter 'symbol'; legal range is '[A-Z0-9-_.]{1,20}$'.
2025-09-24 15:53:30,756 [ERROR] Handel_command func APIError(code=-1121): Invalid symbol.
2025-09-24 16:35:43,936 [ERROR] Invalid Symbol
2025-09-24 16:35:43,937 [INFO] Initiating Market Order to BUY 0.01 BTCUSDT
2025-09-24 16:35:44,183 [INFO] Order confirmed to BUY, Api Response {'orderId': 5678078505, 'symbol': 'BTCUSDT', 'status': 'NEW',
'clientOrderId': 'x-Cb7ytekJe865c33e464b2c4394eb87', 'price': '0.00', 'avgPrice': '0.00', 'origQty': '0.010', 'executedQty': '0.000', 'cumQty':
'0.000', 'cumQuote': '0.00000', 'timeInForce': 'GTC', 'type': 'MARKET', 'reduceOnly': False, 'closePosition': False, 'side': 'BUY',
'positionSide': 'BOTH', 'stopPrice': '0.00', 'workingType': 'CONTRACT_PRICE', 'priceProtect': False, 'origType': 'MARKET', 'priceMatch': 'NONE',
'selfTradePreventionMode': 'EXPIRE_MAKER', 'goodTillDate': 0, 'updateTime': 1758711943673}
2025-09-24 16:37:47,721 [ERROR] Handel_command func APIError(code=-1121): Invalid symbol.
2025-09-24 16:38:23,690 [ERROR] Invalid Symbol
2025-09-24 16:38:23,690 [INFO] Initiating Market Order to BUY 0.01 BTCUSDT
2025-09-24 16:38:23,972 [INFO] Order confirmed to BUY, Api Response {'orderId': 5678080052, 'symbol': 'BTCUSDT', 'status': 'NEW',
'clientOrderId': 'x-Cb7ytekJ7f25fc6d7ad161b061522a', 'price': '0.00', 'avgPrice': '0.00', 'origQty': '0.010', 'executedQty': '0.000', 'cumQty':
'0.000', 'cumQuote': '0.00000', 'timeInForce': 'GTC', 'type': 'MARKET', 'reduceOnly': False, 'closePosition': False, 'side': 'BUY',
'positionSide': 'BOTH', 'stopPrice': '0.00', 'workingType': 'CONTRACT_PRICE', 'priceProtect': False, 'origType': 'MARKET', 'priceMatch': 'NONE',
'selfTradePreventionMode': 'EXPIRE_MAKER', 'goodTillDate': 0, 'updateTime': 1758712103413}
2025-09-24 16:38:54,812 [ERROR] Invalid Symbol
2025-09-24 16:38:54,812 [INFO] Initiating Market Order to SELL 0.01 BTCUSDT
2025-09-24 16:38:55,514 [INFO] Order confirmed to SELL, Api Response {'orderId': 5678080512, 'symbol': 'BTCUSDT', 'status': 'NEW',
'clientOrderId': 'x-Cb7ytekJ7d90d3b78dda82e96265b', 'price': '0.00', 'avgPrice': '0.00', 'origQty': '0.010', 'executedQty': '0.000', 'cumQty': '0.
000', 'cumQuote': '0.00000', 'timeInForce': 'GTC', 'type': 'MARKET', 'reduceOnly': False, 'closePosition': False, 'side': 'SELL', 'positionSide':
'BOTH', 'stopPrice': '0.00', 'workingType': 'CONTRACT_PRICE', 'priceProtect': False, 'origType': 'MARKET', 'priceMatch': 'NONE',
'selfTradePreventionMode': 'EXPIRE_MAKER', 'goodTillDate': 0, 'updateTime': 1758712134868}
```

## 5. Challenges & Learnings

- **API Key & Permissions:** Binance Futures API keys are separate from main account; must enable Futures access
- **Stop-Limit Orders:** Orders immediately triggering require checking current market price
- **Async Execution:** Learned to run async functions without blocking the CLI
- **Error Handling & Validation:** Ensures symbols, quantities, and order parameters are valid; prevents API errors

## 6. Recommendations for Improvement

- **GUI Interface:** PyQt or Tkinter frontend
- **Notification System:** Alerts via email or Telegram for order execution/errors

## 7. Conclusion

The Binance Futures Bot provides a **robust, interactive, and extensible platform** for futures trading strategies. Its support for multiple order types, real-time balance tracking, and asynchronous execution makes it a solid foundation for future improvements like GUI, and automated trading strategies.