

Binance Futures Order Bot Report

1. Introduction

This project implements a CLI-based Binance Futures trading bot in Python.

The bot supports placing **Market** and **Limit** orders on Binance USDT-M Futures Testnet with input validation, structured logging, and error handling.

The goal is to provide a reliable, easy-to-use terminal application for automated futures trading.

2. Features Implemented

- Market order placement with validation and Binance Futures API integration.
 - Limit order placement with price, quantity, and notional checks.
 - Order management: checking open orders and cancelling specific/all orders.
 - Account information display showing balance, open positions, unrealized PnL, and leverage.
 - Centralized configuration for API keys, logging, and time synchronization.
 - Structured logging in `bot.log` for order actions, errors, and diagnostics.
 - Modular code with clear separation between market orders, limit orders, account info, and order management.
-

3. Project Structure

```
your_name_binance_bot/
├── src/
│   ├── main.py          # CLI menu and user interaction
│   ├── config.py        # Centralized API client, time sync, logger
│   ├── market_orders.py
│   ├── limit_orders.py
│   ├── check_orders.py
│   ├── cancel_orders.py
│   ├── account_info.py
│   └── advanced/        # (empty or for future advanced orders)
├── .env                 # API keys (not committed)
├── bot.log              # Logs all actions and errors
├── README.md
├── report.pdf           # This report
└── requirements.txt
```

4. Usage Examples (Screenshots)

CLI Main Menu

```
🚀 Binance Futures Trading CLI (Pro Edition - Testnet)

=====
🧠 Binance Futures Testnet Terminal
=====

[1] Place MARKET Order
[2] Place LIMIT Order
[3] Check Orders
[4] Cancel Orders
[5] Account Info
[0] Exit

Select option: |
```

Sample Market Order Input

```
Select option: 1

● MARKET ORDER

📄 Example valid symbols:
BTCUSDT, ETHUSDT, BCHUSDT, XRPUSDT, LTCUSDT, TRXUSDT, ETCUSDT, LINKUSDT, XLMUSDT, ADAUSDT, ...
Symbol (e.g., BTCUSDT): BTCUSDT
Side (BUY/SELL): BUY
Quantity: 0.01
✅ Market order placed successfully!
```

Sample Limit Order Input

```
Select option: 2

● LIMIT ORDER

📄 Example valid symbols:
BTCUSDT, ETHUSDT, BCHUSDT, XRPUSDT, LTCUSDT, TRXUSDT, ETCUSDT, LINKUSDT, XLMUSDT, ADAUSDT, ...
Symbol (e.g., BTCUSDT): BTCUSDT
Side (BUY/SELL): SELL
Quantity: 0.01
Limit Price: 106900
✅ Limit order placed successfully!
```

Check Orders Screen

```

Select option: 3
Enter symbol (e.g., BTCUSDT): BTCUSDT

📄 Open Orders for BTCUSDT:
→ 6777528394 | SELL LIMIT 0.003 @ 120000 | NEW
→ 6839628987 | SELL LIMIT 0.004 @ 123000 | NEW

📊 Recent Orders for BTCUSDT:
→ 6777998427 | FILLED | LIMIT | 0.002 @ 110000
→ 6839528887 | FILLED | MARKET | 0.003 @ 0
→ 6839628987 | NEW | LIMIT | 0.004 @ 123000
→ 6857382966 | FILLED | MARKET | 0.010 @ 0
→ 6857682767 | FILLED | LIMIT | 0.010 @ 106900

```

Cancel Orders Screen

```

Select option: 4
Enter symbol (e.g., BTCUSDT): BTCUSDT
→ 6777528394 | SELL LIMIT | NEW
→ 6839628987 | SELL LIMIT | NEW
Enter order ID or 'ALL': 6777528394
✅ Order 6777528394 cancelled.

```

Account Info Screen

```

Select option: 5

💰 Binance Futures Account Summary:
Asset      Balance      Available      Cross Wallet
-----
BTC         0.01      0.01000000      0.01000000
USDT    4988.5345891  4731.96397709  4988.53458910
USDC    4999.95026879  4995.01994379  4999.95026879

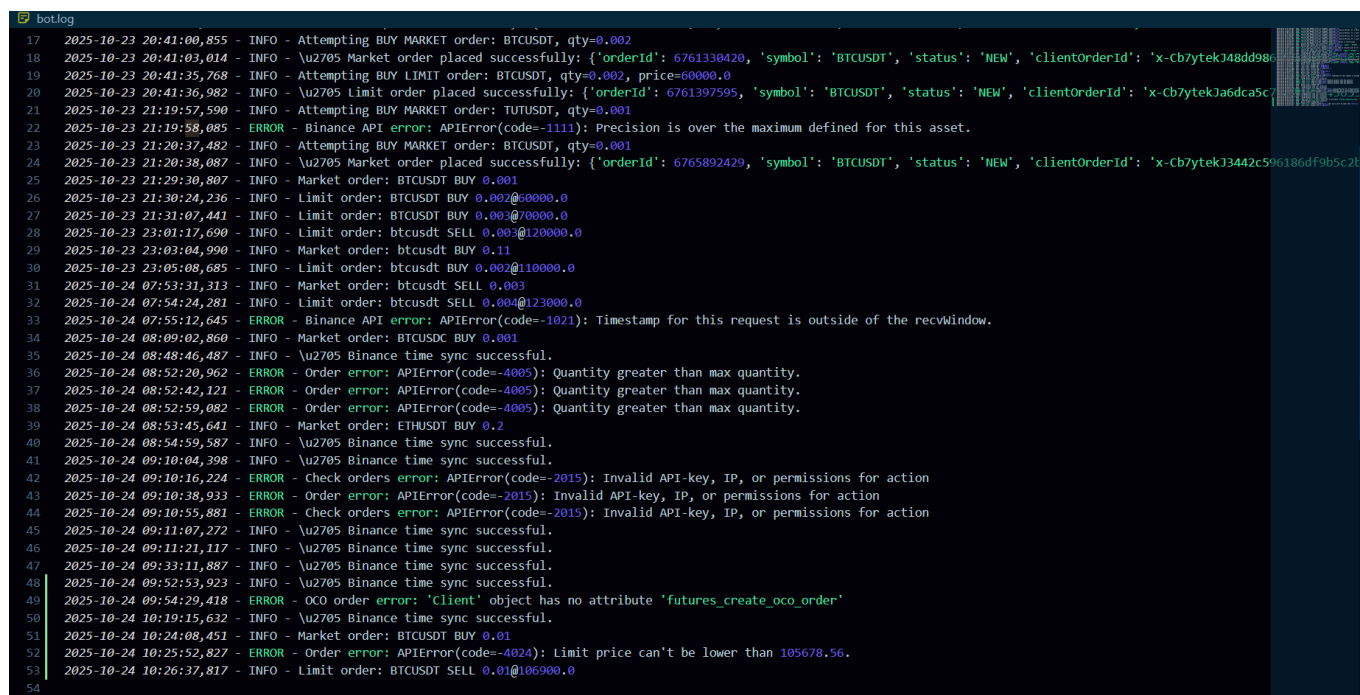
📊 Open Positions:
→ ETHUSDT | LONG 0.2 @ 3883.0 | Leverage: 20x | PnL: 17.44200000
→ BTCUSDC | LONG 0.001 @ 110513.8 | Leverage: 20x | PnL: 0.62670000
→ BTCUSDT | LONG 0.049 @ 110312.4771838 | Leverage: 20x | PnL: 38.16721799

```

5. Error Handling

- The bot validates all user inputs before sending orders to Binance.
- Binance API exceptions (e.g., insufficient margin, invalid symbols) are captured and printed clearly.

- Network or unexpected errors are logged with timestamps in `bot.log` for troubleshooting.
- Input validation prevents erroneous or too-small orders.



```

17 2025-10-23 20:41:00,855 - INFO - Attempting BUY MARKET order: BTCUSDT, qty=0.002
18 2025-10-23 20:41:03,014 - INFO - \u2705 Market order placed successfully: {'orderId': 6761330420, 'symbol': 'BTCUSDT', 'status': 'NEW', 'clientOrderId': 'x-cb7ytekJ48dd98e'}
19 2025-10-23 20:41:35,768 - INFO - Attempting BUY LIMIT order: BTCUSDT, qty=0.002, price=60000.0
20 2025-10-23 20:41:36,982 - INFO - \u2705 Limit order placed successfully: {'orderId': 6761397595, 'symbol': 'BTCUSDT', 'status': 'NEW', 'clientOrderId': 'x-cb7ytekJa6dca5c'}
21 2025-10-23 21:19:57,590 - INFO - Attempting BUY MARKET order: TUTUSDT, qty=0.001
22 2025-10-23 21:19:58,085 - ERROR - Binance API error: APIError(code=-1111): Precision is over the maximum defined for this asset.
23 2025-10-23 21:20:37,482 - INFO - Attempting BUY MARKET order: BTCUSDT, qty=0.001
24 2025-10-23 21:20:38,087 - INFO - \u2705 Market order placed successfully: {'orderId': 6765892429, 'symbol': 'BTCUSDT', 'status': 'NEW', 'clientOrderId': 'x-cb7ytekJ3442c596186df9b5c2t'}
25 2025-10-23 21:29:30,807 - INFO - Market order: BTCUSDT BUY 0.001
26 2025-10-23 21:30:24,236 - INFO - Limit order: BTCUSDT BUY 0.002@60000.0
27 2025-10-23 21:31:07,441 - INFO - Limit order: BTCUSDT BUY 0.003@70000.0
28 2025-10-23 23:01:17,690 - INFO - Limit order: btcusdt SELL 0.003@120000.0
29 2025-10-23 23:03:04,990 - INFO - Market order: btcusdt BUY 0.11
30 2025-10-23 23:05:08,685 - INFO - Limit order: btcusdt BUY 0.002@110000.0
31 2025-10-24 07:53:31,313 - INFO - Market order: btcusdt SELL 0.003
32 2025-10-24 07:54:24,281 - INFO - Limit order: btcusdt SELL 0.004@123000.0
33 2025-10-24 07:55:12,645 - ERROR - Binance API error: APIError(code=-1021): Timestamp for this request is outside of the recvWindow.
34 2025-10-24 08:09:02,860 - INFO - Market order: BTCUSDC BUY 0.001
35 2025-10-24 08:48:46,487 - INFO - \u2705 Binance time sync successful.
36 2025-10-24 08:52:20,962 - ERROR - Order error: APIError(code=-4005): Quantity greater than max quantity.
37 2025-10-24 08:52:42,121 - ERROR - Order error: APIError(code=-4005): Quantity greater than max quantity.
38 2025-10-24 08:52:59,082 - ERROR - Order error: APIError(code=-4005): Quantity greater than max quantity.
39 2025-10-24 08:53:45,641 - INFO - Market order: ETHUSDT BUY 0.2
40 2025-10-24 08:54:59,587 - INFO - \u2705 Binance time sync successful.
41 2025-10-24 09:10:04,398 - INFO - \u2705 Binance time sync successful.
42 2025-10-24 09:10:16,224 - ERROR - Check orders error: APIError(code=-2015): Invalid API-key, IP, or permissions for action
43 2025-10-24 09:10:38,933 - ERROR - Order error: APIError(code=-2015): Invalid API-key, IP, or permissions for action
44 2025-10-24 09:10:55,881 - ERROR - Check orders error: APIError(code=-2015): Invalid API-key, IP, or permissions for action
45 2025-10-24 09:11:07,272 - INFO - \u2705 Binance time sync successful.
46 2025-10-24 09:11:21,117 - INFO - \u2705 Binance time sync successful.
47 2025-10-24 09:33:11,887 - INFO - \u2705 Binance time sync successful.
48 2025-10-24 09:52:53,923 - INFO - \u2705 Binance time sync successful.
49 2025-10-24 09:54:29,418 - ERROR - OCO order error: 'Client' object has no attribute 'futures_create_oco_order'
50 2025-10-24 10:19:15,632 - INFO - \u2705 Binance time sync successful.
51 2025-10-24 10:24:08,451 - INFO - Market order: BTCUSDT BUY 0.01
52 2025-10-24 10:25:52,827 - ERROR - Order error: APIError(code=-4024): Limit price can't be lower than 105678.56.
53 2025-10-24 10:26:37,817 - INFO - Limit order: BTCUSDT SELL 0.01@106900.0
54

```

6. Challenges & Future Enhancements

- **Advanced Order Types:** OCO, Stop-Limit, TWAP, and Grid orders are not yet implemented but planned.
- **Real-time Updates:** Currently, order status updates require user action; adding WebSocket streaming for live data is a future enhancement.
- **Interactive Dashboard:** Implementing a colorized CLI dashboard for live PnL and order tracking.
- **Automated Trading Strategies:** Integrating algorithmic strategies for entry/exit signals based on technical indicators.

7. Conclusion

This project lays a robust foundation for automated futures trading on Binance Testnet.

It meets the core assignment requirements with clean code, strong input validation, consistent logging, and a user-friendly CLI.

With future extensions for advanced order types and real-time features, the bot could evolve into a powerful production system.

8. References

- Binance Futures API Documentation: <https://binance-docs.github.io/apidocs/futures/en/>
- python-binance GitHub: <https://github.com/sammchardy/python-binance>
- python-dotenv Documentation: <https://pypi.org/project/python-dotenv/>