Binance Futures Trading Bot – Functional Report

1. Introduction

This document provides a detailed overview of the **Binance Futures Trading Bot**, including its **features, usage, and performance on the Binance Testnet**. The bot is implemented in Python, supports multiple order types, advanced strategies, and provides comprehensive logging.

2. Setup and Configuration

2.1 Environment Requirements

- Python 3.8 or higher
- Binance Futures Testnet account
- Binance Testnet API Key & Secret

2.2 Installation

```
git clone https://github.com/yourusername/binance-trading-bot.git
cd binance-trading-bot
pip install -r requirements.txt
```

2.3 API Configuration

- Add your Testnet API Key and Secret in `config.py`
- ☐ Ensure keys are **not committed** to GitHub.

3. Running the Bot

3.1 Windows

- Run `run_bot.bat` to start the CLI interface

3.2 Linux/Mac

- Execute: `python cli.py`

4. Feature Demonstrations

4.1 Market Orders

- Execute orders instantly at the current market price.
- Supports **BUY** and **SELL** operations.

```
Select an option: 1

═══ Market Order ═══
Symbol (e.g., BTCUSDT): ETHUSDT
2025-10-24 13:32:44,932 - TradingBot - INFO - Symbol ETHUSDT validated successfully
2025-10-24 13:32:45,473 - TradingBot - INFO - Current price for ETHUSDT: 3948.53
Current price: 3948.53
Side (BUY/SELL): SELL
Quantity: 0.01

Placing SELL market order for 0.01 ETHUSDT...
2025-10-24 13:32:50,981 - TradingBot - INFO - API Request - Order Type: MARKET

2025-10-24 13:32:51,556 - TradingBot - INFO - API Response received
2025-10-24 13:32:51,556 - TradingBot - INFO - [OK] Market SELL order placed successf
ully

√ Order Details:

 Field          Value

 Order ID       5776304617
 Symbol         ETHUSDT
 Side           SELL
 Type           MARKET
 Status         NEW
 Quantity       0.010
 Price          0.00
```

4.2 Limit Orders

- Place orders at specific price levels.
- Automatic price adjustments if outside valid range.

  - Limit order with auto-adjustment:

```
═══ Limit Order ═══
Symbol (e.g., BTCUSDT): ETHUSDT
2025-10-24 13:32:57,175 - TradingBot - INFO - Symbol ETHUSDT validated successfully
2025-10-24 13:32:57,337 - TradingBot - INFO - Current price for ETHUSDT: 3947.14
Current price: 3947.14
Side (BUY/SELL): SELL
Quantity: 0.01
Limit Price: 3000
⚠ Price too low! Minimum SELL price: 3749.78
Adjusting price to 3749.79...

Placing SELL limit order for 0.01 ETHUSDT at 3749.79...
2025-10-24 13:33:07,923 - TradingBot - INFO - API Request - Order Type: LIMIT

2025-10-24 13:33:08,099 - TradingBot - INFO - API Response received
2025-10-24 13:33:08,100 - TradingBot - INFO - [OK] Limit SELL order placed successfu
lly at 3749.79

√ Order Details:

 Field          Value

 Order ID       577637894
 Symbol         ETHUSDT
 Side           SELL
 Type           LIMIT
 Status         NEW
 Quantity       0.010
 Price          3749.79
 Executed Qty   0.000
 Stop Price     0.00
```
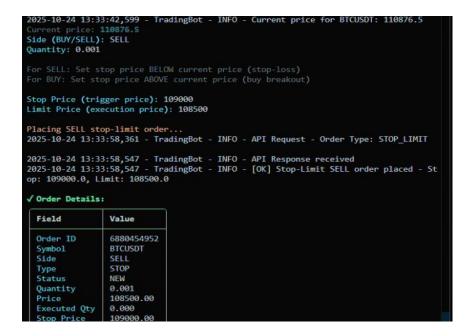
- Limit order with valid price:

```
Select an option: 2

=== Limit Order ===
Symbol (e.g., BTCUSDT): BTCUSDT
2025-10-24 13:33:23,304 - TradingBot - INFO - Symbol BTCUSDT validated successfully
2025-10-24 13:33:23,468 - TradingBot - INFO - Current price for BTCUSDT: 110884.3
Current price: 110884.3
Side (BUY/SELL): BUY
Quantity: 0.001
Limit Price: 110000

Placing BUY limit order for 0.001 BTCUSDT at 110000.0...
2025-10-24 13:33:32,804 - TradingBot - INFO - API Request - Order Type: LIMIT

2025-10-24 13:33:33,493 - TradingBot - INFO - API Response received
2025-10-24 13:33:33,494 - TradingBot - INFO - [OK] Limit BUY order placed successful
ly at 110000.0

✓ Order Details:
```

Field	Value
Order ID	6880409869
Symbol	BTCUSDT
Side	BUY
Type	LIMIT
Status	NEW
Quantity	0.001
Price	110000.00

4.3 Stop-Limit Orders

- Conditional orders that trigger when a specified stop price is reached.
- Acts as a **risk management/stop-loss tool**.

```
2025-10-24 13:33:42,599 - TradingBot - INFO - Current price for BTCUSDT: 110876.5
Current price: 110876.5
Side (BUY/SELL): SELL
Quantity: 0.001

For SELL: Set stop price BELOW current price (stop-loss)
For BUY: Set stop price ABOVE current price (buy breakout)

Stop Price (trigger price): 109000
Limit Price (execution price): 108500

Placing SELL stop-limit order...
2025-10-24 13:33:58,361 - TradingBot - INFO - API Request - Order Type: STOP_LIMIT

2025-10-24 13:33:58,547 - TradingBot - INFO - API Response received
2025-10-24 13:33:58,547 - TradingBot - INFO - [OK] Stop-Limit SELL order placed - St
op: 109000.0, Limit: 108500.0

✓ Order Details:
```

Field	Value
Order ID	6880454952
Symbol	BTCUSDT
Side	SELL
Type	STOP
Status	NEW
Quantity	0.001
Price	108500.00
Executed Qty	0.000
Stop Price	109000.00

4.4 TWAP (Time-Weighted Average Price) Orders

- Splits large orders into smaller chunks over a set duration.
- Demonstrates gradual execution and avoids market impact.

```
═══ TWAP Order (Time-Weighted Average Price) ═══
Splits your order into multiple smaller orders over time

Symbol (e.g., BTCUSDT): BTCUSDT
2025-10-24 13:34:09,524 - TradingBot - INFO - Symbol BTCUSDT validated successfully
Side (BUY/SELL): BUY
Total Quantity: 0.003
Duration (minutes): 1
Number of orders to split into: 3

Summary:
- 3 orders of 0.001 each
- One order every 0.3 minutes
- Total time: 1 minutes

Continue? (yes/no): yes

Placing TWAP order - 3 orders over 1 minutes...
This may take some time...

2025-10-24 13:34:19,510 - TradingBot - INFO - Starting TWAP order - Symbol: BTCUSDT,
 Side: BUY
2025-10-24 13:34:19,510 - TradingBot - INFO - Total Quantity: 0.003, Duration: 1min,
 Orders: 3
2025-10-24 13:34:19,886 - TradingBot - INFO - Placing TWAP order 1/3
2025-10-24 13:34:20,102 - TradingBot - INFO - API Request - Order Type: MARKET

2025-10-24 13:34:20,274 - TradingBot - INFO - API Response received
2025-10-24 13:34:20,276 - TradingBot - INFO - [OK] Market BUY order placed successfu
lly
```

4.5 Grid Trading

- Places multiple buy/sell orders within a price range.
- Useful for automated **buy-low, sell-high strategies**.

```
2025-10-24 13:35:10,477 - TradingBot - INFO - Symbol BTCUSDT validated successfully
2025-10-24 13:35:10,653 - TradingBot - INFO - Current price for BTCUSDT: 110814.1
Current price: 110814.1
Side (BUY/SELL): BUY
Total Quantity: 0.005

Recommended: Set prices within ±5% of current price
Lower Price: 108000
Upper Price: 112000
Number of grid levels: 5

Summary:
- 5 orders of 0.001 each
- Price range: 108000.00 - 112000.00
- Price step: 1000.00

Continue? (yes/no): yes

Placing Grid order with 5 levels...
2025-10-24 13:35:24,233 - TradingBot - INFO - Starting Grid order - Symbol: BTCUSDT,
 Side: BUY
2025-10-24 13:35:24,233 - TradingBot - INFO - Price Range: 108000.0 - 112000.0, Grid
s: 5
2025-10-24 13:35:25,120 - TradingBot - INFO - Placing grid order 1/5 at price 108000
.0
2025-10-24 13:35:26,486 - TradingBot - INFO - API Request - Order Type: LIMIT

2025-10-24 13:35:26,655 - TradingBot - INFO - API Response received
2025-10-24 13:35:26,655 - TradingBot - INFO - [OK] Limit BUY order placed successful
ly at 108000.0
2025-10-24 13:35:26,656 - TradingBot - INFO - [OK] Grid order 1 placed
```
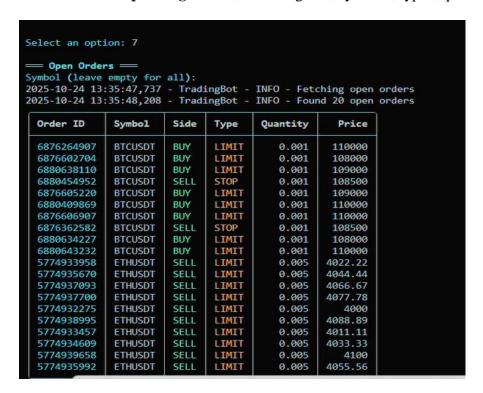
4.6 Account and Order Management

4.6.1 Viewing Account Balance

- Displays **asset, balance, and available funds**.


```
Select an option: 6

=== Account Balance ===
2025-10-24 13:35:42,456 - TradingBot - INFO - Fetching account balance
2025-10-24 13:35:42,642 - TradingBot - INFO - API Response received

Asset      Balance          Available

BTC        0.01000000       0.01000000
USDT       4998.03026749    4724.58683249
USDC       5000.00000000    5000.00000000
```

4.6.2 Viewing Open Orders

- Shows all **pending orders**, including IDs, symbols, types, quantities, and prices.


```
Select an option: 7

=== Open Orders ===
Symbol (leave empty for all):
2025-10-24 13:35:47,737 - TradingBot - INFO - Fetching open orders
2025-10-24 13:35:48,208 - TradingBot - INFO - Found 20 open orders

Order ID     Symbol     Side   Type    Quantity    Price

6876264907   BTCUSDT    BUY    LIMIT     0.001      110000
6876602704   BTCUSDT    BUY    LIMIT     0.001      108000
6880638110   BTCUSDT    BUY    LIMIT     0.001      109000
6880454952   BTCUSDT    SELL   STOP      0.001      108500
6876605220   BTCUSDT    BUY    LIMIT     0.001      109000
6880409869   BTCUSDT    BUY    LIMIT     0.001      110000
6876606907   BTCUSDT    BUY    LIMIT     0.001      110000
6876362582   BTCUSDT    SELL   STOP      0.001      108500
6880634227   BTCUSDT    BUY    LIMIT     0.001      108000
6880643232   BTCUSDT    BUY    LIMIT     0.001      110000
5774933958   ETHUSDT    SELL   LIMIT     0.005      4022.22
5774935670   ETHUSDT    SELL   LIMIT     0.005      4044.44
5774937093   ETHUSDT    SELL   LIMIT     0.005      4066.67
5774937700   ETHUSDT    SELL   LIMIT     0.005      4077.78
5774932275   ETHUSDT    SELL   LIMIT     0.005      4000
5774938995   ETHUSDT    SELL   LIMIT     0.005      4088.89
5774933457   ETHUSDT    SELL   LIMIT     0.005      4011.11
5774934609   ETHUSDT    SELL   LIMIT     0.005      4033.33
5774939658   ETHUSDT    SELL   LIMIT     0.005      4100
5774935992   ETHUSDT    SELL   LIMIT     0.005      4055.56
```

4.6.3 Cancelling Orders

- Allows cancellation of open limit/stop-limit/grid orders.

```
Select an option: 8

═══ Cancel Order ═══
Note: Cannot cancel already filled or expired orders

Symbol: ETHUSDT
Order ID: 5776317894
2025-10-24 13:36:11,389 - TradingBot - INFO - Checking status for order 5776317894
2025-10-24 13:36:11,883 - TradingBot - INFO - API Response received
⚠ Cannot cancel order - Status: FILLED

Press Enter to continue...
```

4.6.4 Checking Order Status

- Shows detailed order info: status, executed quantity, prices.

```
Select an option: 9

═══ Order Status ═══
Symbol: ETHUSDT
Order ID: 5776317894
2025-10-24 13:35:59,270 - TradingBot - INFO - Checking status for order 5776317894
2025-10-24 13:35:59,744 - TradingBot - INFO - API Response received

✓ Order Details:

Field           Value

Order ID        5776317894
Symbol          ETHUSDT
Side            SELL
Type            LIMIT
Status          FILLED
Quantity        0.010
Price           3749.79
Executed Qty    0.010
Stop Price      0.00
```

4.6.5 Fetching Current Prices

- Retrieves real-time market prices for multiple symbols.

```
Select an option: 10

═══ Current Price ═══
Symbol (e.g., BTCUSDT): BTCUSDT
2025-10-24 13:36:21,110 - TradingBot - INFO - Current price for BTCUSDT: 110851.1

√ Current price for BTCUSDT: 110851.1

Press Enter to continue...


┌────────┬──────────────────────────────────┐
│   1    │   Place Market Order             │
│   2    │   Place Limit Order              │
│   3    │   Place Stop-Limit Order         │
│   4    │   Place TWAP Order (Advanced)    │
│   5    │   Place Grid Order (Advanced)    │
│   6    │   View Account Balance           │
│   7    │   View Open Orders               │
│   8    │   Cancel Order                   │
│   9    │   Check Order Status             │
│   10   │   Get Current Price              │
│   0    │   Exit                           │
└────────┴──────────────────────────────────┘
```

5. Observations & Notes

- Bot successfully places **market, limit, stop-limit, TWAP, and grid orders**.
- Input validation prevents invalid orders.
- Logs provide detailed traceability for each operation.
- CLI interface is interactive and intuitive.

6. Conclusion

The **Binance Futures Trading Bot** is fully functional on the **Testnet environment**, demonstrating:

- Core trading functionalities
- Advanced trading strategies
- Robust logging and error handling

It is ready for further development, custom strategy implementation, and testing of additional scenarios.