Binance Futures Order Bot — Report

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- Repo: https://github.com/lakshaydahiya67/Binance-Futures-Orders-Bot

Objective & Scope

CLI bot for Binance USDT-M Futures (testnet). Core: Market, Limit. Bonus: Stop-Limit, OCO-style, TWAP, Grid. Structured JSON logging and basic input validation.

Setup (run once)

- Ensure `.env` exists in project root:
  - `BINANCE_API_KEY=...`
  - `BINANCE_API_SECRET=...`
- Activate environment and set module path:
  ```bash
source venv/bin/activate
export PYTHONPATH=src
  ```

Demonstration (Core and Advanced Orders)

Market (BUY)


  ```json
{"timestamp": "2025-08-09T18:56:43.744798+05:30", "level": "INFO", "message": "Connected to Binance testnet", "data": {"server_time": {"serverTime": 1754746003657}, "connection_status": "success"}}
{"timestamp": "2025-08-09T18:56:43.745096+05:30", "level": "INFO", "message": "API request: place_market_order", "data": {"action": "place_market_order", "parameters": {"symbol": "BTCUSDT", "side": "BUY", "type": "MARKET", "quantity": 0.001}}}
{"timestamp": "2025-08-09T18:56:44.215862+05:30", "level": "INFO", "message": "Market order executed successfully", "data": {"order_type": "Market", "symbol": "BTCUSDT", "side": "BUY", "quantity": "0.001", "order_id": 5558426133, "status": "NEW", "executed_qty": "0.000", "executed_price": null}}
```

```

### Limit (BUY below market)

```json
{"timestamp": "2025-08-09T19:08:20.411274+05:30", "level": "INFO", "message":
"Connected to Binance testnet", "data": {"server_time": {"serverTime": 1754746700328},
"connection_status": "success"}}
{"timestamp": "2025-08-09T19:08:20.411551+05:30", "level": "INFO", "message": "API
request: place_limit_order", "data": {"action": "place_limit_order", "parameters": {"symbol":
"BTCUSDT", "side": "BUY", "type": "LIMIT", "quantity": 0.001, "price": 116000.0,
"timeInForce": "GTC"}}}
{"timestamp": "2025-08-09T19:08:20.887603+05:30", "level": "INFO", "message": "Limit
order executed successfully", "data": {"order_type": "Limit", "symbol": "BTCUSDT", "side":
"BUY", "quantity": "0.001", "order_id": 5558466036, "status": "NEW", "executed_qty":
"0.000", "executed_price": null}}
```

Stop-Limit (BUY; non-triggering)

```json
{"timestamp": "2025-08-09T19:18:57.253323+05:30", "level": "INFO", "message":
"Connected to Binance testnet", "data": {"server_time": {"serverTime": 1754747337173},
"connection_status": "success"}}
{"timestamp": "2025-08-09T19:18:57.253631+05:30", "level": "INFO", "message": "API
request: place_stop_limit_order", "data": {"action": "place_stop_limit_order", "parameters":
```

{"symbol": "BTCUSDT", "side": "BUY", "type": "STOP", "quantity": 0.001, "price": 119900.0, "stopPrice": 120000.0, "timeInForce": "GTC"}}}
{"timestamp": "2025-08-09T19:18:57.745703+05:30", "level": "INFO", "message": "Stop-Limit order executed successfully", "data": {"order_type": "Stop-Limit", "symbol": "BTCUSDT", "side": "BUY", "quantity": "0.001", "order_id": 5558499137, "status": "NEW", "executed_qty": "0.000", "executed_price": null}}
```

OCO-style SELL (futures simulated):


```json
{"timestamp": "2025-08-09T19:21:57.009399+05:30", "level": "INFO", "message": "Connected to Binance testnet", "data": {"server_time": {"serverTime": 1754747516918}, "connection_status": "success"}}
{"timestamp": "2025-08-09T19:21:57.009950+05:30", "level": "WARNING", "message": "OCO orders require manual management in futures - placing two separate orders", "data": {"order_type": "OCO", "implementation": "manual_management", "note": "placing_separate_orders"}}
{"timestamp": "2025-08-09T19:21:57.010185+05:30", "level": "INFO", "message": "API request: place_oco_limit_order", "data": {"action": "place_oco_limit_order", "parameters": {"symbol": "BTCUSDT", "side": "SELL", "type": "LIMIT", "quantity": 0.001, "price": 116200.0, "timeInForce": "GTC"}}}
{"timestamp": "2025-08-09T19:21:57.501698+05:30", "level": "INFO", "message": "API request: place_oco_stop_order", "data": {"action": "place_oco_stop_order", "parameters": {"symbol": "BTCUSDT", "side": "SELL", "type": "STOP_MARKET", "quantity": 0.001, "stopPrice": 115800.0}}}
{"timestamp": "2025-08-09T19:21:58.003073+05:30", "level": "INFO", "message": "OCO-style orders placed successfully", "data": {"order_type": "OCO", "limit_order_id": 5558508843, "stop_order_id": 5558508849, "symbol": "BTCUSDT", "side": "SELL", "quantity": "0.001", "limit_price": "116200", "stop_price": "115800"}}
```

TWAP (BUY; total divisible by chunk)

```
(venv) lakshaydahiya@laptop:~/Downloads/assignment/Primetrade.ai/Python Development internship$ python src/advanced/twap.py BTCUSDT BUY 0.05 60 0.01
2025-08-09 20:10:36,476 - INFO - Connected to Binance testnet
INFO:__main__:Connected to Binance testnet
2025-08-09 20:10:36,477 - INFO - TWAP execution plan initialized
INFO:__main__:TWAP execution plan initialized
TWAP Order Execution Plan:
Total Quantity: 0.05
Chunk Size: 0.01
Number of Chunks: 5
Remaining Quantity: 1.734723475976807e-18
Interval: 10.00 seconds
Starting execution...

2025-08-09 20:10:36,477 - INFO - API request: place_twap_chunk_1
INFO:__main__:API request: place_twap_chunk_1
2025-08-09 20:10:36,675 - INFO - TWAP chunk 1/5 executed
INFO:__main__:TWAP chunk 1/5 executed
Chunk 1/5 executed:
  Order ID: 5558676992
  Quantity: 0.010
  Status: NEW
  Waiting 10.00 seconds...
2025-08-09 20:10:46,676 - INFO - API request: place_twap_chunk_2
INFO:__main__:API request: place_twap_chunk_2
2025-08-09 20:10:47,208 - INFO - TWAP chunk 2/5 executed
INFO:__main__:TWAP chunk 2/5 executed
Chunk 2/5 executed:
  Order ID: 5558677176
  Quantity: 0.010
  Status: NEW
  Waiting 10.00 seconds...
2025-08-09 20:10:57,209 - INFO - API request: place_twap_chunk_3
INFO:__main__:API request: place_twap_chunk_3
2025-08-09 20:10:57,383 - INFO - TWAP chunk 3/5 executed
INFO:__main__:TWAP chunk 3/5 executed
Chunk 3/5 executed:
  Order ID: 5558677358
  Quantity: 0.010
  Status: NEW
  Waiting 10.00 seconds...
2025-08-09 20:11:07,383 - INFO - API request: place_twap_chunk_4
```

```
2025-08-09 20:10:57,209 - INFO - API request: place_twap_chunk_3
INFO:__main__:API request: place_twap_chunk_3
2025-08-09 20:10:57,383 - INFO - TWAP chunk 3/5 executed
INFO:__main__:TWAP chunk 3/5 executed
Chunk 3/5 executed:
  Order ID: 5558677358
  Quantity: 0.010
  Status: NEW
  Waiting 10.00 seconds...
2025-08-09 20:11:07,383 - INFO - API request: place_twap_chunk_4
INFO:__main__:API request: place_twap_chunk_4
2025-08-09 20:11:07,859 - INFO - TWAP chunk 4/5 executed
INFO:__main__:TWAP chunk 4/5 executed
Chunk 4/5 executed:
  Order ID: 5558677526
  Quantity: 0.010
  Status: NEW
  Waiting 10.00 seconds...
2025-08-09 20:11:17,860 - INFO - API request: place_twap_chunk_5
INFO:__main__:API request: place_twap_chunk_5
2025-08-09 20:11:18,348 - INFO - TWAP chunk 5/5 executed
INFO:__main__:TWAP chunk 5/5 executed
Chunk 5/5 executed:
  Order ID: 5558679802
  Quantity: 0.010
  Status: NEW
  Waiting 10.00 seconds...
2025-08-09 20:11:28,349 - INFO - API request: place_twap_remaining
INFO:__main__:API request: place_twap_remaining
2025-08-09 20:11:28,514 - ERROR - Order execution failed: TWAP_Remaining_Error
ERROR:__main__:Order execution failed: TWAP_Remaining_Error
Error executing remaining quantity: (400, -1111, 'Precision is over the maximum defined for this asset.', {'Content-Type': 'application/json', 'Content-Length': '76
', 'Connection': 'keep-alive', 'Date': 'Sat, 09 Aug 2025 14:41:28 GMT', 'Access-Control-Allow-Methods': 'GET, POST, PUT, DELETE, OPTIONS', 'Server': 'Bengine', 'x-m
bx-used-weight-1m': '-1', 'x-mbx-order-count-10s': '0', 'x-mbx-order-count-1m': '0', 'x-response-time': '0ms', 'Access-Control-Allow-Origin': '*', 'X-Cache': 'Error
 from cloudfront', 'Via': '1.1 f58f65c11a806a22e60fa9ba6e024136.cloudfront.net (CloudFront)', 'X-Amz-Cf-Pop': 'DEL54-P5', 'X-Amz-Cf-Id': 'nhck0e8mXwb1yJ7yMgPlZwM8UF
YufXcJyNXC407gPl_h8rbGw2xfcg=='})
2025-08-09 20:11:28,514 - INFO - TWAP order execution completed
INFO:__main__:TWAP order execution completed

TWAP Order Complete: 5 orders executed
(venv) lakshaydahiya@laptop:~/Downloads/assignment/Primetrade.ai/Python Development internship$
```

```json
{"timestamp": "2025-08-09T19:23:44.722922+05:30", "level": "INFO", "message": "Connected to Binance testnet", "data": {"server_time": {"serverTime": 1754747624645}, "connection_status": "success"}}
{"timestamp": "2025-08-09T19:23:44.723262+05:30", "level": "INFO", "message": "TWAP execution plan initialized", "data": {"order_type": "TWAP", "symbol": "BTCUSDT", "side": "BUY", "total_quantity": 0.05, "chunk_size": 0.01, "num_chunks": 5, "remaining_quantity": 1.734723475976807e-18, "interval_seconds": 10.0}}
```

{"timestamp": "2025-08-09T19:23:44.723475+05:30", "level": "INFO", "message": "API request: place_twap_chunk_1", "data": {"action": "place_twap_chunk_1", "parameters": {"symbol": "BTCUSDT", "side": "BUY", "type": "MARKET", "quantity": 0.01}}}
{"timestamp": "2025-08-09T19:23:45.211276+05:30", "level": "INFO", "message": "TWAP chunk 1/5 executed", "data": {"order_type": "TWAP_CHUNK", "chunk_number": 1, "total_chunks": 5, "symbol": "BTCUSDT", "side": "BUY", "quantity": "0.010", "order_id": 5558514878, "status": "NEW"}}
{"timestamp": "2025-08-09T19:23:55.211845+05:30", "level": "INFO", "message": "API request: place_twap_chunk_2", "data": {"action": "place_twap_chunk_2", "parameters": {"symbol": "BTCUSDT", "side": "BUY", "type": "MARKET", "quantity": 0.01}}}
{"timestamp": "2025-08-09T19:23:55.379248+05:30", "level": "INFO", "message": "TWAP chunk 2/5 executed", "data": {"order_type": "TWAP_CHUNK", "chunk_number": 2, "total_chunks": 5, "symbol": "BTCUSDT", "side": "BUY", "quantity": "0.010", "order_id": 5558515056, "status": "NEW"}}
{"timestamp": "2025-08-09T19:24:05.379819+05:30", "level": "INFO", "message": "API request: place_twap_chunk_3", "data": {"action": "place_twap_chunk_3", "parameters": {"symbol": "BTCUSDT", "side": "BUY", "type": "MARKET", "quantity": 0.01}}}
{"timestamp": "2025-08-09T19:24:05.860165+05:30", "level": "INFO", "message": "TWAP chunk 3/5 executed", "data": {"order_type": "TWAP_CHUNK", "chunk_number": 3, "total_chunks": 5, "symbol": "BTCUSDT", "side": "BUY", "quantity": "0.010", "order_id": 5558516274, "status": "NEW"}}
{"timestamp": "2025-08-09T19:24:15.860704+05:30", "level": "INFO", "message": "API request: place_twap_chunk_4", "data": {"action": "place_twap_chunk_4", "parameters": {"symbol": "BTCUSDT", "side": "BUY", "type": "MARKET", "quantity": 0.01}}}
{"timestamp": "2025-08-09T19:24:16.337252+05:30", "level": "INFO", "message": "TWAP chunk 4/5 executed", "data": {"order_type": "TWAP_CHUNK", "chunk_number": 4, "total_chunks": 5, "symbol": "BTCUSDT", "side": "BUY", "quantity": "0.010", "order_id": 5558517545, "status": "NEW"}}
{"timestamp": "2025-08-09T19:24:26.337941+05:30", "level": "INFO", "message": "API request: place_twap_chunk_5", "data": {"action": "place_twap_chunk_5", "parameters": {"symbol": "BTCUSDT", "side": "BUY", "type": "MARKET", "quantity": 0.01}}}
{"timestamp": "2025-08-09T19:24:26.816027+05:30", "level": "INFO", "message": "TWAP chunk 5/5 executed", "data": {"order_type": "TWAP_CHUNK", "chunk_number": 5, "total_chunks": 5, "symbol": "BTCUSDT", "side": "BUY", "quantity": "0.010", "order_id": 5558517657, "status": "NEW"}}
{"timestamp": "2025-08-09T19:24:36.816576+05:30", "level": "INFO", "message": "API request: place_twap_remaining", "data": {"action": "place_twap_remaining", "parameters": {"symbol": "BTCUSDT", "side": "BUY", "type": "MARKET", "quantity": 1.734723475976807e-18}}}
{"timestamp": "2025-08-09T19:24:37.308739+05:30", "level": "ERROR", "message": "Order execution failed: TWAP_Remaining_Error", "data": {"error_type": "TWAP_Remaining_Error", "details": "(400, -1111, 'Precision is over the maximum defined for this asset.', {'Content-Type': 'application/json', 'Content-Length': '76', 'Connection': 'keep-alive', 'Date': 'Sat, 09 Aug 2025 13:54:37 GMT', 'Access-Control-Allow-Methods': 'GET, POST, PUT, DELETE, OPTIONS', 'Server': 'Bengine', 'x-mbx-used-weight-1m': '-1', 'x-mbx-order-count-10s': '0', 'x-mbx-order-count-1m': '0', 'x-response-time': '0ms', 'Access-Control-Allow-Origin': '*', 'X-Cache': 'Error from cloudfront', 'Via': '1.1 a9fc660f0a2dafc29cb1fe2bba69768e.cloudfront.net (CloudFront)', 'X-Amz-Cf-Pop':

'DEL54-P5', 'X-Amz-Cf-Id':
'FtRId43rAqsRttAWeZI5z6RerYE9645-kqMkI-yMQ2m8mEoKUHAfRg=='})"}}
{"timestamp": "2025-08-09T19:24:37.309072+05:30", "level": "INFO", "message": "TWAP
order execution completed", "data": {"order_type": "TWAP", "symbol": "BTCUSDT", "side":
"BUY", "total_orders_executed": 5, "planned_orders": 6, "success_rate":
0.8333333333333334}}
```

### Grid (5 levels around current price)

```
(venv) lakshaydahiya@laptop:~/Downloads/assignment/Primetrade.ai/Python Development internship$ python src/advanced/grid.py BTCUSDT 115800 116200 5 0.001
2025-08-09 20:13:02,223 - INFO - Connected to Binance testnet
INFO:__main__:Connected to Binance testnet
2025-08-09 20:13:02,788 - INFO - Grid strategy market data retrieved
INFO:__main__:Grid strategy market data retrieved
Grid Order Execution Plan:
Symbol: BTCUSDT
Current Price: 116919.9
Price Range: 115800.0 - 116200.0
Grid Levels: 5
Price Step: 100.00
Quantity per Level: 0.001
Starting execution...

2025-08-09 20:13:02,789 - INFO - API request: place_grid_order_1
INFO:__main__:API request: place_grid_order_1
2025-08-09 20:13:03,280 - INFO - Grid order 1/5 placed
INFO:__main__:Grid order 1/5 placed
Grid Level 1/5 - BUY Order:
  Order ID: 5558684458
  Price: 115800.0
  Quantity: 0.001
  Status: NEW
2025-08-09 20:13:03,280 - INFO - API request: place_grid_order_2
INFO:__main__:API request: place_grid_order_2
2025-08-09 20:13:03,761 - INFO - Grid order 2/5 placed
INFO:__main__:Grid order 2/5 placed
Grid Level 2/5 - BUY Order:
  Order ID: 5558684470
  Price: 115900.0
  Quantity: 0.001
  Status: NEW
2025-08-09 20:13:03,762 - INFO - API request: place_grid_order_3
INFO:__main__:API request: place_grid_order_3
2025-08-09 20:13:04,239 - INFO - Grid order 3/5 placed
INFO:__main__:Grid order 3/5 placed
Grid Level 3/5 - BUY Order:
  Order ID: 5558684486
  Price: 116000.0
  Quantity: 0.001
  Status: NEW
```

```
  Order ID: 5558684470
  Price: 115900.0
  Quantity: 0.001
  Status: NEW
2025-08-09 20:13:03,762 - INFO - API request: place_grid_order_3
INFO:__main__:API request: place_grid_order_3
2025-08-09 20:13:04,239 - INFO - Grid order 3/5 placed
INFO:__main__:Grid order 3/5 placed
Grid Level 3/5 - BUY Order:
  Order ID: 5558684486
  Price: 116000.0
  Quantity: 0.001
  Status: NEW
2025-08-09 20:13:04,239 - INFO - API request: place_grid_order_4
INFO:__main__:API request: place_grid_order_4
2025-08-09 20:13:04,407 - INFO - Grid order 4/5 placed
INFO:__main__:Grid order 4/5 placed
Grid Level 4/5 - BUY Order:
  Order ID: 5558684490
  Price: 116100.0
  Quantity: 0.001
  Status: NEW
2025-08-09 20:13:04,407 - INFO - API request: place_grid_order_5
INFO:__main__:API request: place_grid_order_5
2025-08-09 20:13:04,878 - INFO - Grid order 5/5 placed
INFO:__main__:Grid order 5/5 placed
Grid Level 5/5 - BUY Order:
  Order ID: 5558684505
  Price: 116200.0
  Quantity: 0.001
  Status: NEW
2025-08-09 20:13:04,879 - INFO - Grid order execution completed
INFO:__main__:Grid order execution completed

Grid Orders Complete: 5/5 orders placed successfully

Grid Strategy Active:
- Buy orders below 116919.9
- Sell orders above 116919.9
- Monitor and manage orders as market moves
(venv) lakshaydahiya@laptop:~/Downloads/assignment/Primetrade.ai/Python Development internship$
```

```json

{"timestamp": "2025-08-09T19:26:26.099432+05:30", "level": "INFO", "message": "Connected to Binance testnet", "data": {"server_time": {"serverTime": 1754747786015}, "connection_status": "success"}}
{"timestamp": "2025-08-09T19:26:26.572722+05:30", "level": "INFO", "message": "Grid strategy market data retrieved", "data": {"symbol": "BTCUSDT", "current_price": 116920.6, "grid_range_low": 115800.0, "grid_range_high": 116200.0}}
{"timestamp": "2025-08-09T19:26:26.573192+05:30", "level": "INFO", "message": "API request: place_grid_order_1", "data": {"action": "place_grid_order_1", "parameters": {"symbol": "BTCUSDT", "side": "BUY", "type": "LIMIT", "quantity": 0.001, "price": 115800.0, "timeInForce": "GTC"}}}
{"timestamp": "2025-08-09T19:26:27.048389+05:30", "level": "INFO", "message": "Grid order 1/5 placed", "data": {"order_type": "GRID_ORDER", "grid_level": 1, "total_levels": 5, "grid_price": 115800.0, "symbol": "BTCUSDT", "side": "BUY", "quantity": "0.001", "order_id": 5558524240, "status": "NEW"}}
{"timestamp": "2025-08-09T19:26:27.048800+05:30", "level": "INFO", "message": "API request: place_grid_order_2", "data": {"action": "place_grid_order_2", "parameters": {"symbol": "BTCUSDT", "side": "BUY", "type": "LIMIT", "quantity": 0.001, "price": 115900.0, "timeInForce": "GTC"}}}
{"timestamp": "2025-08-09T19:26:27.527792+05:30", "level": "INFO", "message": "Grid order 2/5 placed", "data": {"order_type": "GRID_ORDER", "grid_level": 2, "total_levels": 5, "grid_price": 115900.0, "symbol": "BTCUSDT", "side": "BUY", "quantity": "0.001", "order_id": 5558524245, "status": "NEW"}}
{"timestamp": "2025-08-09T19:26:27.528209+05:30", "level": "INFO", "message": "API request: place_grid_order_3", "data": {"action": "place_grid_order_3", "parameters": {"symbol": "BTCUSDT", "side": "BUY", "type": "LIMIT", "quantity": 0.001, "price": 116000.0, "timeInForce": "GTC"}}}
{"timestamp": "2025-08-09T19:26:27.693727+05:30", "level": "INFO", "message": "Grid order 3/5 placed", "data": {"order_type": "GRID_ORDER", "grid_level": 3, "total_levels": 5, "grid_price": 116000.0, "symbol": "BTCUSDT", "side": "BUY", "quantity": "0.001", "order_id": 5558524247, "status": "NEW"}}
{"timestamp": "2025-08-09T19:26:27.694065+05:30", "level": "INFO", "message": "API request: place_grid_order_4", "data": {"action": "place_grid_order_4", "parameters": {"symbol": "BTCUSDT", "side": "BUY", "type": "LIMIT", "quantity": 0.001, "price": 116100.0, "timeInForce": "GTC"}}}
{"timestamp": "2025-08-09T19:26:28.172523+05:30", "level": "INFO", "message": "Grid order 4/5 placed", "data": {"order_type": "GRID_ORDER", "grid_level": 4, "total_levels": 5, "grid_price": 116100.0, "symbol": "BTCUSDT", "side": "BUY", "quantity": "0.001", "order_id": 5558524254, "status": "NEW"}}
{"timestamp": "2025-08-09T19:26:28.172842+05:30", "level": "INFO", "message": "API request: place_grid_order_5", "data": {"action": "place_grid_order_5", "parameters": {"symbol": "BTCUSDT", "side": "BUY", "type": "LIMIT", "quantity": 0.001, "price": 116200.0, "timeInForce": "GTC"}}}
{"timestamp": "2025-08-09T19:26:28.654972+05:30", "level": "INFO", "message": "Grid order 5/5 placed", "data": {"order_type": "GRID_ORDER", "grid_level": 5, "total_levels": 5, "grid_price": 116200.0, "symbol": "BTCUSDT", "side": "BUY", "quantity": "0.001", "order_id": 5558524270, "status": "NEW"}}
{"timestamp": "2025-08-09T19:26:28.655384+05:30", "level": "INFO", "message": "Grid order execution completed", "data": {"order_type": "GRID", "symbol": "BTCUSDT", "current_price":

116920.6, "price_range_low": 115800.0, "price_range_high": 116200.0, "total_levels": 5,
"orders_placed": 5, "success_rate": 1.0}}
```

Validation & Logging (Evidence)

- Invalid side

python src/market_orders.py BTCUSDT HOLD 0.001 || true &&
tail -n 4 bot.log

```json
{"timestamp": "2025-08-09T19:28:55.897496+05:30", "level": "ERROR", "message":
"Validation failed: market_order_validation", "data": {"error_type": "market_order_validation",
"details": {"symbol": "BTCUSDT", "side": "HOLD", "quantity": "0.001", "error_message": "Side
must be BUY or SELL"}}}
```

- Negative quantity

python src/market_orders.py BTCUSDT BUY -1 || true &&
tail -n 4 bot.log

```json
{"timestamp": "2025-08-09T19:30:03.248073+05:30", "level": "ERROR", "message":
"Validation failed: market_order_validation", "data": {"error_type": "market_order_validation",
"details": {"symbol": "BTCUSDT", "side": "BUY", "quantity": "-1", "error_message": "Quantity
must be positive"}}}
```

- Invalid limit price (non-positive)

python src/limit_orders.py BTCUSDT BUY 0.001 -1 || true &&
tail -n 4 bot.log

```json
{"timestamp": "2025-08-09T19:31:15.281895+05:30", "level": "ERROR", "message":
"Validation failed: limit_order_validation", "data": {"error_type": "limit_order_validation",
"details": {"symbol": "BTCUSDT", "side": "BUY", "quantity": "0.001", "price": "-1",
"error_message": "Price must be positive"}}}
```

- Stop/limit invalid relation (BUY with stop <= limit)

python src/advanced/stop_limit.py BTCUSDT BUY 0.001 120000 130000 || true &&
tail -n 6 bot.log

```json
{"timestamp": "2025-08-09T19:31:58.994062+05:30", "level": "ERROR", "message":
"Validation failed: stop_limit_order_validation", "data": {"error_type":
"stop_limit_order_validation", "details": {"symbol": "BTCUSDT", "side": "BUY", "quantity":
"0.001", "stop_price": "120000", "limit_price": "130000", "error_message": "For BUY orders:
stop price must be higher than limit price"}}}
```

- Grid invalid range (low >= high)

python src/advanced/grid.py BTCUSDT 120000 110000 5 0.001 || true &&
tail -n 6 bot.log

```json
{"timestamp": "2025-08-09T19:32:36.922602+05:30", "level": "ERROR", "message":
"Validation failed: grid_order_validation", "data": {"error_type": "grid_order_validation",
"details": {"symbol": "BTCUSDT", "price_low": "120000", "price_high": "110000",
"grid_levels": "5", "quantity_per_level": "0.001", "error_message": "Low price must be less
than high price"}}}
```

- TWAP invalid duration

python src/advanced/twap.py BTCUSDT BUY 0.01 -10 0.005 || true &&
tail -n 6 bot.log

```json
{"timestamp": "2025-08-09T19:33:00.397180+05:30", "level": "ERROR", "message":
"Validation failed: twap_order_validation", "data": {"error_type": "twap_order_validation",
"details": {"symbol": "BTCUSDT", "side": "BUY", "total_quantity": "0.01", "time_duration":
"-10", "chunk_size": "0.005", "error_message": "Time duration must be positive"}}}
```

Notes

- OCO on futures is simulated with two orders (limit + stop); manual management required.
- Testnet only. Timestamps in `bot.log` are Asia/Kolkata by default (configurable via
`BOT_LOG_TZ`).

Conclusion

- Core (Market/Limit) and advanced (Stop-Limit, OCO-style, TWAP, Grid) orders
implemented.
- Structured JSON logging with validation evidence provided.