

# Market Mechanics and Design Choices

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## Core Mechanics:

The simulator supports **Limit orders** (specifying price/quantity, can rest in the book) and **Market orders** (execute immediately). At its core is a **Limit Order Book (LOB)** with sorted bid (buy) and ask (sell) sides.

## Matching and Price:

Orders are matched deterministically: a trade occurs when the best bid meets or exceeds the best ask. Market orders execute against the book top; limit orders execute if they cross the book, otherwise they rest. Trades can be partial. Prices are endogenously formed through order placement and matching.

## Event-Driven Simulation:

The simulation operates in discrete steps: agents decide to act, submit orders, the LOB processes matches, and trades/snapshots are recorded.

## Agents:

The system includes simplified trader classes:

- **Random traders:** Submit random limit orders.
- **Market takers:** Submit market orders for immediate execution.
- **Market makers:** Place limit orders around a price to provide liquidity.

## Conclusion:

The simulator captures essential exchange features: order-driven trading, FIFO price-time priority, endogenous price formation, liquidity dynamics, and heterogeneous participants.

It also includes order cancellations and asynchronous agent participation (arrival probabilities) for greater realism.