

Designing an Exchange

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Contents

1	Introduction	3
2	Order Types	3
2.0.1	Market Orders	3
2.0.2	Limit Orders	4
3	Orderbook Design	4
4	Orderbook Matching	4
5	Exchange Design	4
6	Networking	4
7	C Code	4

1 Introduction

The aim of this project is to provide insight into the inner workings of an exchange as well as the orderbook matching algorithms used. I have chosen to conduct this in C to force myself to learn the language. C does also provide benefits such as fast execution speeds and direct access to memory, both which are core to creating a good exchange. This documentation will discuss the choices made as well explanations of the relevant algorithms used. Eventually, a server will be set up to allow multiple agents to trade, mimicking a real exchange.

2 Order Types

We have decided to select a few order types that can be executed, these reflect the most common trades made and will allow the user to have enough flexibility to be useful. Though not in surplus of features, the aim of this project is on the order matching algorithm, not on the wants of the user. The different types being offered include:

1. Market Orders
2. Limit Orders
3. Stop-loss Orders
4. Stop-limit Orders
5. All or None Orders
6. Immediate or Cancel
7. Fill or Kill
8. Good 'Til Cancelled

2.0.1 Market Orders

These are the most trivial of orders, simply buying or selling at or near the posted price. These guarantee a position in market and will be executed as soon as possible.

2.0.2 Limit Orders

Limit orders can be thought of as pending orders that are only executed once a certain condition or limit is reached. This limit is based on the price of the security being traded. The order will be cancelled if the price is not met whilst trying to sell or buy at the pre-determined level. 4 types of Limit orders exist: Buy limit, Sell limit, Buy stop, and Sell stop.

Explain

3 Orderbook Design

4 Orderbook Matching

5 Exchange Design

6 Networking

7 C Code