# Exchange Simulator Document

## File

--------------------boost (install by users themselves)

--------------------pack

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|--------client---------client.cpp

| |

| |----transform.hpp

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|--------monitor------monitor.cpp

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|--------server---------server.cpp

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|------Fix.h

|

|------Fix.cpp

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|------Orderbook.h

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|------Orderbook.cpp

Client folder contains the implementation of the client.

Monitor folder contains the implementation of the monitor client

Server folder contains the implementation of the server.

## Public Interface

Command line.

Run the server before running client and monitor client. Make sure the client can ping package to the corresponding server IP, and change the connecting IP in the client.cpp.

Client’s operation menu displays clearly on the command line window.

Orderbook is empty when the program runs initially every time, which means users should add all the orders every time they run the program.

Monitor client will keep displaying the orderbook on the server.

Server will display some irrespective messages.

## Function

Finish homework 1 & 2 & 3 & 5.

That means my server only serves ONE client (excluding monitor client).

Only ONE stock is available.

Add a new order, cancel an existing order, fill orders, display orderbook on the monitor client, check local orderbook on the client.

The available time for server to accept operating message is 9:00 ~ 11:00 & 13:00 ~ 16:00 (UTC+8). Users can send message to server when the local time is 9:00 ~ 11:00 or 13:00 ~ 16:00, but server will reject.

The memory footprint of orderbook cannot be greater than the size of Heap.

## Algorithm & Data Structure

Use ordered vector to maintain the orderbooks. (Implement in the Orderbook.h & Orderbook.cpp)

Insert O (logn)

Delete (fill order) O (1)

Delete (cancel order) O (logn)

Use FIX4.2 to interact between server and client (excluding monitor client). (Implement in the Fix.h & Fix.cpp)

Some other algorithms (illegal input handling) implemented in transform.hpp.