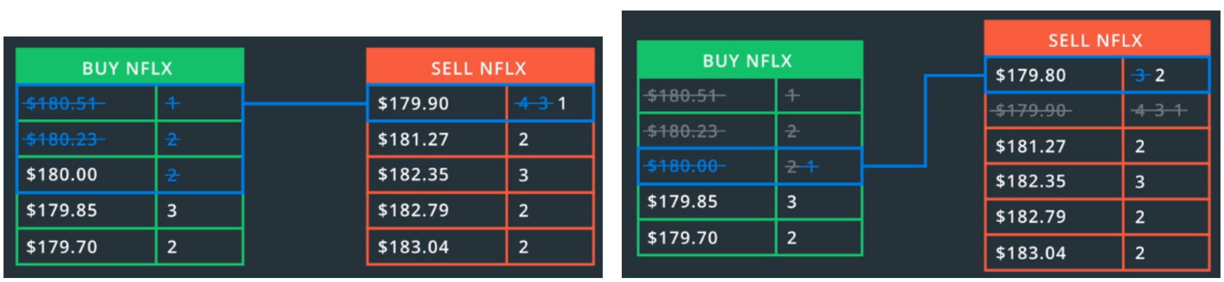
Market Mechanics

This lesson introduce the mechanics behind modern-day stock markets. And then we build a simple market simulator that matches and executes orders, and sets prices like a real market, which can help us get a better idea off all the activities that keep a market running. From the market data which generate from such activities, we can find some important clues that we can use to decide when to buy and sell stocks. Try to build an intuition that why some dimensions are important when we process various dimensions of data. Finally, we try to process the data during the closing and opening of global markets and try to find some trading opportunities.

Trading Stocks

When a company first begins trading publicly, the value for its stock based on the company metrics like revenue, profits, assets and so on. Then the stocks prices almost depend on how much demand exists for the stock. The demand means how many people what to buy some stock or how much money they will pay for it. So we should to see how many orders people are placing for it and at what price. Modern markets keep an electronic record of all orders, including the the limit prices to pay for it by buyer and the least amount by seller. When a suitable mach is found between a buyer and seller, the trade is executed. The following picture shows how orders are matched:



(a) (b)

Figure 1: How to match orders

The table BUY NFLX stores the orders for Netflix's stocks from buyers and sorts them by price, the table SELL NFLX stores the limit sell orders and the asking prices from sellers. Science the lowest asking price is less than the topmost buy order, the transaction will execute. When a lower sell price appears, it will rise to the top of the sell queue then the transaction continues.

In modern markets, stock exchanges help buyers and sellers match their orders, stock exchanges keep track of the last price at which a stock was traded and set it as the current price of the stock, if someone wants to buy or sell around this price, they can trade immediately.

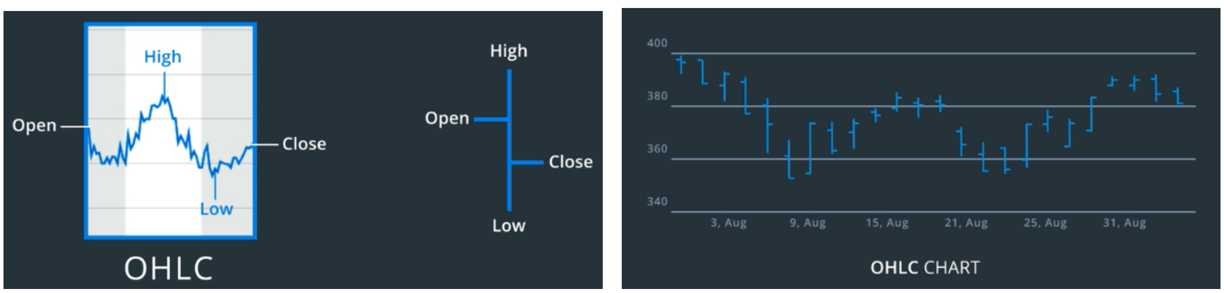
The market maker is a financial firm, usually a brokerage that continuously offers to buy and sell stocks at publicly advertised prices. They take the risk by continuously buying and selling, but they are usually compensated for the risk by commissions and fees from trades. Market makers usually buy some stocks which sellers want to sell from stock exchanges, and then they ask for a slightly higher price to sell to others who want to buy such stocks. The difference between these prices is known as Bid-Ask Spread.

Liquidity

Liquidity is the property of a financial asset like a stock, to be bought or sold without causing sharp changes in its price. Market maker facilitates transactions so it provides liquidity.

OHLC

OHLC is the Open, High, Low, Close in a period.



(a) (b)

Figure 2: OHLC

Volume

Gaps in Market Data

Markets in Different Timezones

Different Stock Exchanges have different open and close times because they locate in different time zones. It will produce some additional complications and opportunities for the traders. For example, Hong Kong Stock Exchange opens at 9:30 AM local time, London Stock Exchange opens seven hours later and New York Stock Exchange opens thirteen hours later. If a stock rises in Hong Kong before the open time of the London Stock Exchange, we can buy the stock in London the moment the market opens (but take care other traders may do the same operate).