

ASSESSMENT PROBLEM STATEMENT

TRANSACTIONS

There are 2 main types of transactions in the stock market : BUY and SELL.
BUY leads to the increase in the number of stocks and SELL leads to the decrease in the number of stocks for an investor's holdings.

DATE	COMPANY	TRADE TYPE	QUANTITY	PRICE PER SHARE	BALANCE QTY
01/01/2023	ABC Ltd.	BUY	100	1000rs	100
02/01/2023	ABC Ltd.	BUY	200	1010rs	300
03/01/2023	ABC Ltd.	SELL	50	1020rs	250

AVERAGE BUY PRICE

Average price is the mean price of an asset or security observed over some period of time. It is calculated by finding the simple arithmetic average of closing prices over a specified time period. When adjusted by trading volume, the volume-weighted average price (VWAP) can be derived on an intraday basis.

FIFO (FIRST IN FIRST OUT)

First In, First Out(FIFO) is an accounting method in which shares purchased first are sold first. FIFO assumes that the remaining inventory(Holding) consists of shares purchased last.

CALCULATION OF AVG. BUY PRICE

The calculation of the buy average price follows the First In, First Out (FIFO) method, where the shares that were bought first are deemed to be sold first from the account.

Example Scenario

In the above table, 20 quantities are sold in the third row. As per FIFO method, this is deducted from 50 quantities in the first row. So 30 quantities will be remaining, which is considered while calculating the buy average.

TRADE DATE	COMPANY	TRADE TYPE	QTY	PRICE
16/02/2018	ABC Ltd.	BUY	50	260₹
19/02/2018	ABC Ltd.	BUY	30	256₹
21/02/2018	ABC Ltd.	SELL	20	275₹
25/02/2018	ABC Ltd.	BUY	20	270₹

The buy average of ABC Ltd. in the holdings is 261₹ $[(30*260) + (30*256) + (20*270) / (50+30-20+20)]$.

SPLIT

A stock-split happens when a company issues more shares to its existing shareholders by reducing the face value per share. This is done at a specified ratio.

For example, a split ratio of 1:2 for a share with a face value of ₹10 implies that for every one share held, a shareholder gets two shares, each with a face value of ₹5. After a split, the stock starts trading at the adjusted price. For example, if the share price was ₹900, then it would fall to ₹450 (1:2 ratio) immediately after the split. Beyond the immediate impact, the price of the stock may actually go up if there is higher demand for it.

TRADE DATE	COMPANY	TRADE TYPE	QTY	PRICE
16/02/2018	ABC Ltd.	BUY	100	100₹
17/02/2018	ABC Ltd.	BUY	100	200₹
18/02/2018	ABC Ltd.	SPLIT of 1:5	-	-
19/02/2018	ABC Ltd.	SELL	400	45₹

Balance Qty. after first day = 100

Avg buy price after first day = 100₹

Balance Qty. after second day = 200

Avg buy price after second day = $(100*100 + 100*200)/200 = 150₹$

Balance Qty. after third day = $200*5 = 1000$

Avg. buy price after third day = 30₹

Now after the third day there will be 2 types of shares in the inventory, 500 shares of 20₹ (100/5) each and 500 shares of 40₹(200/5) each.

So when 400 shares will be sold on the 4th day, all 400 will be sold from the 500 shares of 20₹ each i.e. the shares bought on the first day(according to FIFO).

So after the 4th day's SELL transaction 100 shares of 20₹ each will be left and 500 shares of 40₹ each will be left in the inventory.

Balance Qty after fourth day = 600

Avg. buy price after fourth day = $(100 \times 20 + 500 \times 40) / 600 = 36.67₹$

WHAT NEEDS TO BE IMPLEMENTED?

Build a system using Django REST Framework and Django ORM which supports a mechanism which will calculate average buy price and balance quantity after every transaction.

Setup your own database which will consist of transactions of 3 types, BUY, SELL and SPLIT.

The system should follow FIFO while selling shares.

The following APIs need to be created:

1. APIs which enable addition of above mentioned 3 types of transactions.
2. An API which returns average buy price and balance quantity after any day.