**Core**

SQL

Final Project - Part 0

Data Model Enhancement

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We want to further enhance the trading platform schema. The enhancements will allow tracking of shareholders, the trades made by the shareholders, as well as track how many shares each company has authorized for its stock.

# Shares, Trades and Ownership

The value of stock is that it represents ownership of the company and the right to vote on company decisions. But the main purpose of stock is that a company can sell shares in order to raise money. Shares can also be given out directly from the company as bonuses, payments, or gifts etc.

## Authorized Shares

Before a company can sell or give any stock away it must declare the total number of shares which can be issued (**authorized shares**).

Definition of 'Authorized Stock'

The maximum number of shares that a corporation is legally permitted to issue, as specified in its articles of incorporation.   
Also known as "authorized shares" or "authorized capital stock."

Because a company is legally bound to not issue more than this total number, the authorized amount must be recorded in our database. A company can change its articles of incorporation and change the number of authorized shares. We will want to keep the history of authorized shares in our database.

When the board of directors chooses how many shares will be authorized, they must also choose a starting price. This starting price must be recorded in our database (in the company’s chosen currency).

## Issuing Shares

Once a company is authorized to issue shares, it can sell shares to an investment bank in order to raise capital (trade for cash). A company can also provide shares to company insiders (trade for services provided). Trades such as these occur on what is called the **primary market**. The primary market is also known as the **new issue market (NIM)** because shares change from being unissued to issued when such trades are made. We want to track these trades in our database. Such trades will have a buyer and a seller (the company itself), and a total price. Total prices on the new issue market will be recorded in the currency chosen by the company. Such trades do not occur at stock markets and there are no brokers involved. Typically a company will sell a large block of shares to an investment bank in order to raise capital, but nonetheless, many of the authorized shares will remain unissued (**unissued shares**).

The investment bank then sells their shares in **secondary markets** such as the New York stock exchange (NYSE). These shares can be freely traded among shareholders on the public markets and are called the **public float, share float** or simply, **float**. We want to record these trades on the secondary markets in our database as well. Such trades will have a buyer and a broker for the buyer, a seller and a broker for the seller, and these trades take place at stock markets. Price totals for secondary market trades will be recorded in the currency used by the particular stock market.

The shares that the company gives to company insiders might have certain restrictions (**restricted shares**). For example, the shareholder might not be allowed to sell the shares for several months. However, we are not going to track restrictions in our database. Therefore, we will not be able to distinguish between restricted shares and the public float.

Shares Issued = Shares Outstanding = Restricted Shares + Public Float

Shares Authorized = Shares Issued + Shares Unissued

The percentage of issued shares held by a person determines the percentage of the company he or she controls. For example, if the incorporated business has a total of 1,000 shares outstanding and an individual shareholder has 150 of these. That person is then said to have 15% company ownership (150/1,000). The number of authorized shares in the company might be 10,000 or even 100,000, but this is irrelevant when determining a person's percentage holding and ownership. Only issued shares are counted.

## Follow-on offering

A follow-on offering is an issuance of additional stock after an initial public offering. A follow-on offering can be either of two types (or a mixture of both): dilutive and non-dilutive.

### Dilutive

In the case of the dilutive offering, the company's board of directors agrees to increase the share float. Shares that were unissued are sold to an investment bank on the primary market.

### Non-Dilutive

The non-dilutive type of follow-on offering is when privately held shares are offered for sale to the public on secondary markets by company directors or other insiders. Because no new shares are created, the offering is not dilutive to existing shareholders.

## Stock Splits and Reverse Splits

A company can decide to increase or decrease the number of shares issued by splitting or merging respectively. When a stock split occurs, the number of shares held by all shareholders doubles, triples, or quadruples depending on the split factor. (It is also possible for the split to be 3 for 2. That is, if a shareholder had 2 shares before the split they would end up with 3 shares after the split). When a reverse split occurs (also known as a stock merge) the number of shares held by all shareholders is reduced by some factor.

We want the database to handle stock splits and merges but all existing trade data much remain unchanged (for historic purposes). To handle a stock split, the number of shares for each shareholder must be adjusted. To make these "upward" adjustments, entries should be made for each current shareholder to add the additional shares to which the shareholder is entitled. To handle a reverse split, the number of shares for each shareholder must be adjusted. For these "downward" adjustments, entries should be made for each current shareholder to subtract shares.

## Share Buy-Back

A company can reduce the size of the share float by purchasing its own shares back from its shareholders. The shares that are bought back are called **treasury shares**. Laws regarding repurchases can vary from country to country and state to state. For our purposes, we will treat treasury shares in accordance with the definition on Investopedia:

Definition of 'Treasury Stock (Treasury Shares)'

The portion of shares that a company keeps in their own treasury. Treasury stock may have come from a repurchase or buyback from shareholders; or it may have never been issued to the public in the first place. These shares don't pay dividends, have no voting rights, and should not be included in shares outstanding calculations.

# Shareholders

We are going to track two types of shareholders: institutional holders (companies), individual people (direct holders). If a shareholder is a direct holder then we will need to track only his or her first and last name. If a shareholder is a company then we will need to track the company name, and the location of the company's head office. A company may, itself, have its own stock ID and be traded on a stock exchange.

# Stock Prices

When the directors of the company choose how many shares will be authorized, they must also recommend a starting price in the currency of their choice. We will need to record the starting price in our database. After trading starts, stock prices change based on what shareholders are willing to pay at the time. Therefore prices can and will change throughout the trading day. We want our database to be able to record these price changes. If possible, please model your data so that queries can retrieve the price that is active at a point in time without using subqueries.

# Data Model Submission

Draw by hand the necessary additions on your stock market ERD. If you have access to Visio or some other drawing tool feel free to use it, but hand drawn additions will be perfectly acceptable.

Hand in your solution to the data model enhancement first thing in the morning when you will receive part 1 and 2 of the project. Part 1 and 2 involves writing queries and procedures.