

380 Project: Stock Exchange Database

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Introduction

In simple terms, the **Stock Exchange Market** (or Stock Market for short) is a market in which companies sell stocks (i.e. shares) to investors.

Concretely, companies must acquire money to finance their expansion and growth, companies do that by selling what's called a *stock*, which is, stocks are traded to *Investors*.

Companies rely on a *Stock Market* to moderate and manage the transactions and security of their stocks. In Saudi Arabia, the only existing stock market is called *Tadawul* (تداول) and it moderates 202 different stocks identified by their *Stock Symbol* (e.g. *Othaim Markets* Stock symbol is 4001).

A company may sell a number of stocks publicly through *Tadawul*, and a *Bank* which processes the money exchange from investors. The person in charge of deciding whether a company sells stocks or not is usually the *CEO* of the company.

So the database we're aiming to build should enable the management of the stock market via secure transactions between companies, investors, and banks.

Objectives

- Manage company stocks by building a database to store stock data (Company associated with Stock, number of stocks, etc.)
- Accelerate the trade of stocks by systematizing the process online via a database (In the past trading was not done over the internet)
- Securely trade stocks between companies and investors

Data requirements

- Stock Market's name, market cap, currency
- Info about a Company's name, commercial registration number (رقم السجل التجاري) is collected as well as info about the CEO of the company
- In each transaction, we should store the Investor info such as his name and IBAN, along with the Stock he bought (identified by its stock symbol) and the Bank that made this transaction. This is to ensure secure trade among parties

Functions

- Display a Stock's data (e.g. price, no. of available Stock)
- Display a Company's data to investors (e.g. Company Equity, CEO data, etc.)
- Process buy and sell transactions
- Add new Companies, Stocks, Investors, etc
- Delete Companies, Stocks, Investors, etc
- Keep track of each Stock's data and update it periodically

Entities and attributes

- Stock Market is identified by **Name**. Currency, market cap, and number of stock symbols are also recorded
- Stock is identified by **Stock symbol**. Number of public stocks, stock price are also recorded
- Investor is identified by **IBAN No**. Networth, ID, sex, age, **name** are also recorded.
- Company is identified by **Commercial registration number**. Company equity, company name, number of directors are also recorded
- Bank is identified by **Commercial registration number**. name, number of branches are also recorded
- The CEO is identified by **name**. Sex, age are also recorded

Red	Primary Key
Green	Composite Attribute
Yellow	Partial Key

Relationships

- Stock Market has a relationship **Manage** with Stock (1-m)
- Company has a relationship **Run by** with CEO (1-1)
- Company has a relationship **Associated** with Stock (1-1)
- Stock has a relationship **Owned** with Investor (n-m)
- Stock has a relationship **Secures** with Bank (n-m)
- Investors has a relationship **Secures** with Bank (n-m)

Business rules

Constraints

- The CEO **can't** run more than one Company
- Company **can't** be associated with more than one Stock
- Stock **can only** be managed by one Stock Market

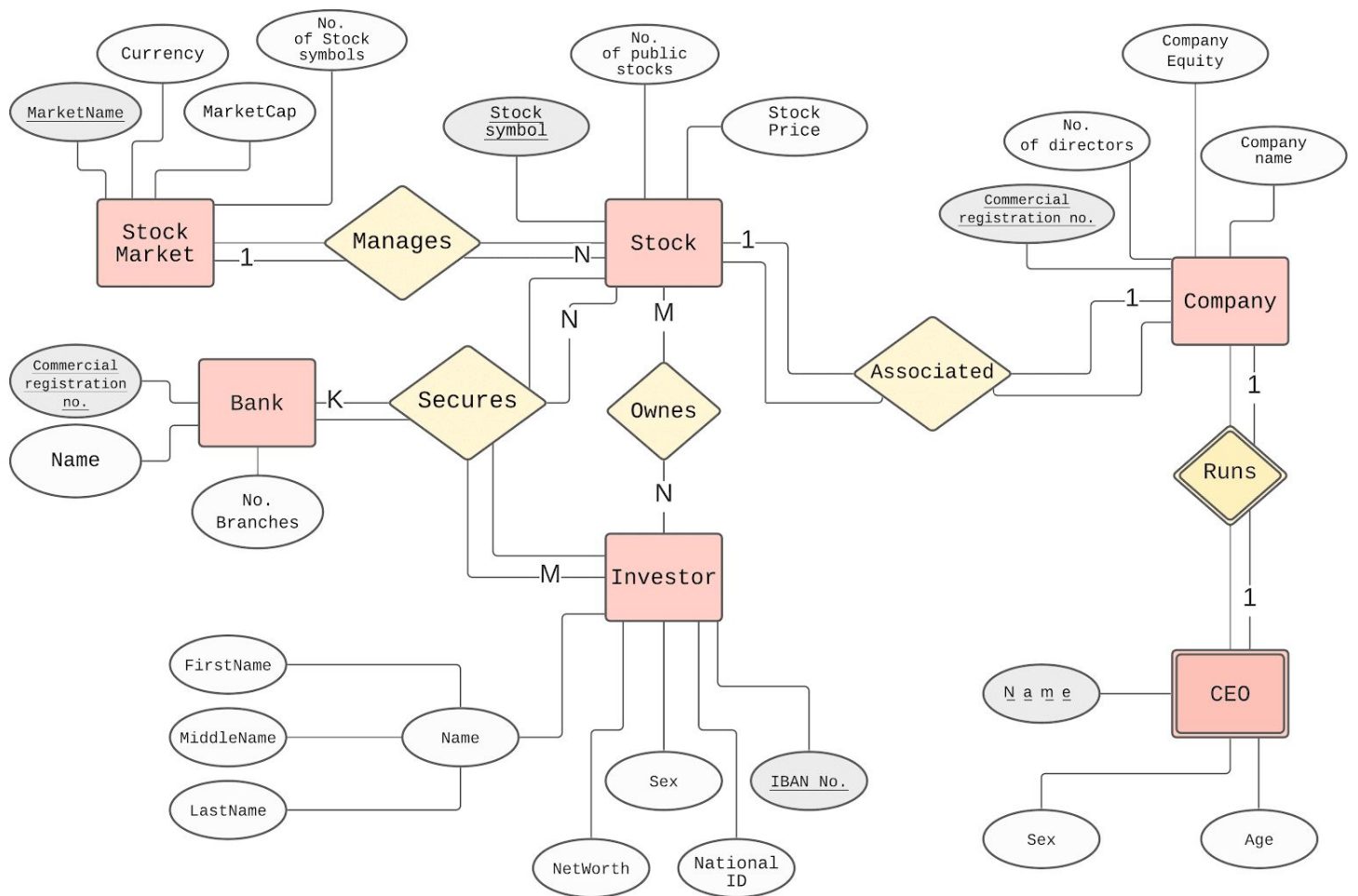
Participation

- Stock Market **totally participate** in manage
- Stock **totally participate** in manage
- Stock **totally participate** in secures
- Stock **totally participate** in associate
- Stock **partially participate** in own
- Company **totally participate** in associate
- Company **totally participate** in run
- CEO **totally participate** in run
- Investors **totally participate** in secures
- Investors **partially participate** in own
- Bank **totally participate** in secures

Queries

1	SELECT ALL INVESTORS WITH NETWORTH > 420 MILLION RIYALS
2	SELECT ALL STOCKS WITH NO. PUBLIC STOCKS < 20
3	DISPLAY LAST NAME OF INVESTOR WITH IBAN NO. NL12RAB08139718173
4	SELECT ALL INVESTORS WHO ARE SECURED BY BANKS WITH COMMERCIAL REGISTRATION NO. 1110001116
5	SELECT ALL INVESTORS WHO OWN STOCK WITH STOCK SYMBOL 4001
6	LIST ALL COMPANIES WITH STOCK WITH STOCK PRICE > 103.5
7	LIST ALL STOCKS ASSOCIATED WITH COMPANIES THAT HAS MINIMUM NO. OF DIRECTORS OF 3
8	LIST ALL BANKS WHO SECURE INVESTORS WITH OWNED STOCK WITH STOCK SYMBOL 4161
9	SELECT ALL CEOS WHO RUN COMPANIES WHICH ARE ASSOCIATED WITH STOCK WITH STOCK PRICE < 200
10	SELECT ALL MALE CEOS THAT RUN COMPANIES ASSOCIATED WITH STOCKS OWNED BY INVESTORS WHOSE AGE IS OVER 50

Entity Relationship Diagram (ERD)



Relational Model Diagram:

