

## 380 Project: Stock Exchange Database

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# Before Edits

## 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 *400*).

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

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## 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.** Network, 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

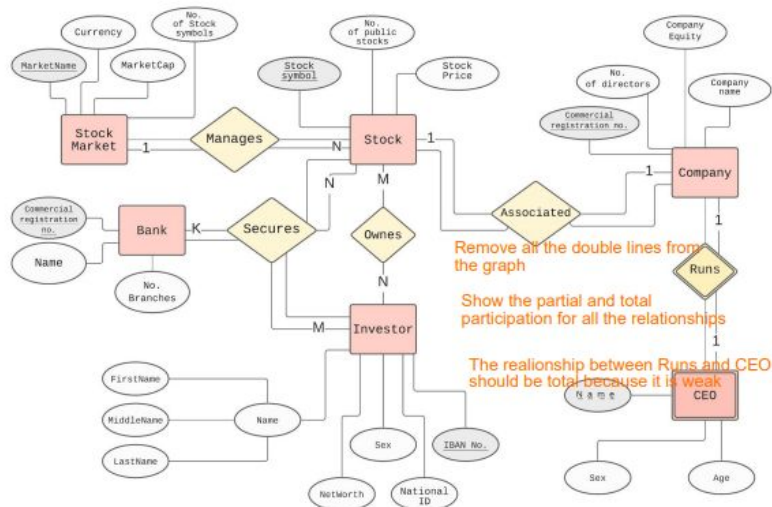
### Participation

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

## Entity Relationship Diagram (ERD)



# After Edits

# Introduction

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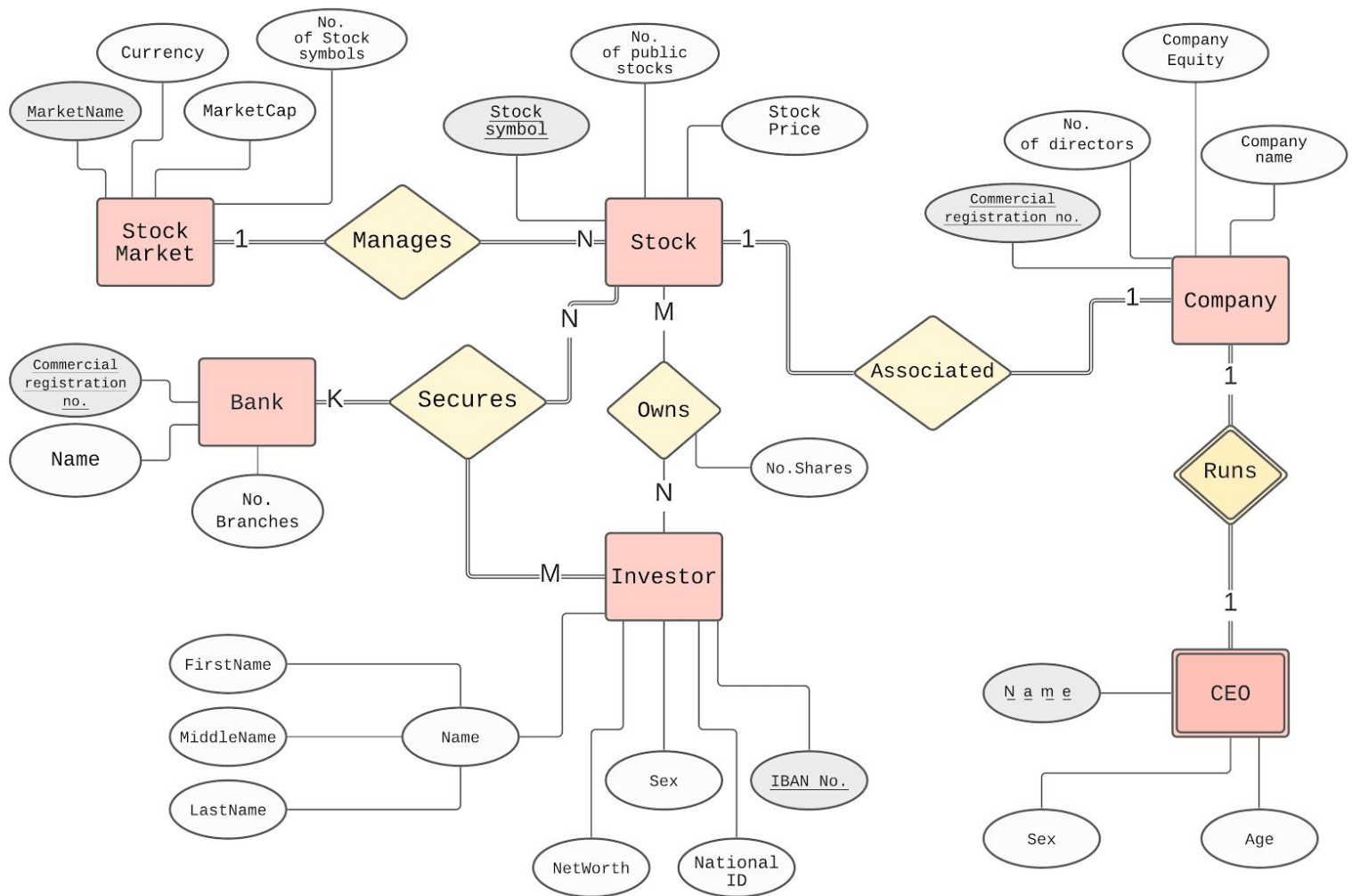
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# Entity Relationship Diagram (ERD)



# Relational Model Diagram:

