Database Systems

database vs database management system (DBMS)

- A relational database organises data based on a relational data model
- DBMS is a software that enables users to maintain it.
- These programs allow users to create, update, insert, or delete data in the system, and they provide:
  - Data structure
  - Multi-user access
  - Privilege control
  - Network access

DBMS (Database Management System)

These are systems that allow users/ applications to interact with databases

- **There are 2 types of popular models for DBMS**
  1. Relational databases (aka RDBMS)
  2. Non-relational databases (aka NOSQL databases)

- Popular RDBMS systems include MySQL, PostgreSQL etc
- Popular NoSQL database systems include MongoDB, Redis

Relational databases

- In relational model, each table has at least one column that uniquely identifies a row.

- Such unique column is referred as `primary key` column.
- This helps users to keep track of each record and return the record on ad hoc (as needed) basis.

Why do we use relational databases?

- ACID principles

`foreign key`

- If you wish 2 tables should have association with each other, one of the way is with `foreign key`.
- A foreign key is essentially a copy of one table's (the "parent" table) primary key inserted into a column in another table (the "child").
- The following example highlights the relationship between two tables, one used to record information about employees at a company and another used to track the company's sales. In this example, the primary key of the EMPLOYEES table is used as the foreign key of the SALES table:

What is SQL?

- Structured Query Language (SQL) is the standard programming language for interacting with relational database management systems.
- Pronounced as `SEQUEL`
- Relational databases are also referred to as "SQL databases" at times.