Chapter 1 : Introduction

What is a relational database?

* collection of related files.
* files have a predefined structure.
* data are organized for efficient retrieval.

Example: Rose is 16 & she is friends with Matt who is 15. Joe is 17 and Sam is 14. Matt, Joe, & Sam are friends.

Query: – Who are Joe's friend?
– List the 16 year olds
– Who has 14 year old friends?

Name	Age
Rose	16
Matt	15
Joe	17
Sam	14

Name	Friends
Rose	Matt
Matt	Joe
Matt	Sam
Joe	Matt
Joe	Sam
Sam	Matt
Sam	Joe
Matt	Rose

Files – Tables or Relations

Why 2 files? Why not 1?
- Normalization

File vs. Database approach

* file based : change data file structure ⇒ changing all programs that access the file
  database : decoupling of applications & data

* database : stores both data & metadata – data definition

* database : structure for efficient retrieval
  ↓ index
  ↓ fits into MM

* language for querying & building database
  - SQL Structured Query Language

* computer crashes
* data consistency & redundancy
* data security
* concurrent access of data

Applications can be independent of data : data definition

storage, management

Philosophy: all about the data

- Data is persistent
- Data is more important than programs that access & manage the data
- Data is large (does not fit in mm)

Database systems: database + DBMS

↓

collection of programs that allow user to create, maintain, and query a database

Popular DBMS vendors: ORACLE, IBM, Microsoft MySQL

Other Data models:

* XML: hierarchical } semi-structured
* NoSQL: Not only SQL
* unstructured: text documents.