Relational Databases

- RDBMS: Relational database management system
- SQL: Structured Query Language
  https://en.wikipedia.org/wiki/Relational_database

Popular Vendors - SQL Is Leading

https://db-engines.com/en/ranking

Rank			DBMS
Jun 2021	May 2021	Jun 2020	
1.	1.	1.	Oracle ➕
2.	2.	2.	MySQL ➕
3.	3.	3.	Microsoft SQL Server ➕
4.	4.	4.	PostgreSQL ➕
5.	5.	5.	MongoDB ➕
6.	6.	6.	IBM Db2 ➕
7.	7.	⬆ 8.	Redis ➕
8.	8.	⬇ 7.	Elasticsearch ➕

Relations / Tables / Entities

SQL term	Relational term	Example
Table	Relation or Base relvar	Player, Court, Booking
Row	Tuple or record	Booking "Fred, Friday, 14:00, Court 1
Column	Attribute or field	Player.id, Player.first_name, Player.last_name
View or result set	Derived relation	All bookings for court 2 on friday

Table Player

id	name	birthday
1	Max	2008-04-01
2	Peter	2005-05-01
3	Leon	1990-12-01
4	Paul	1993-06-01
5	Ben	2004-09-01
6	Finn	1988-08-01
7	Felix	2001-06-01
8	Lina	2003-03-01
9	Lea	1996-11-01
10	Clara	1989-12-01
11	Hanna	2000-01-01

Table Booking With Relation To Player

	id	court	player_id	start_time	end_time
1	1	1	2	2021-06-22 12:00:00.000000	2021-06-22
2	2	2	3	2021-06-22 12:00:00.000000	2021-06-22
3	3	2	4	2021-06-22 13:00:00.000000	2021-06-22
4	4	2	5	2021-06-22 14:00:00.000000	2021-06-22
5	5	3	6	2021-06-22 12:00:00.000000	2021-06-22
6	6	3	7	2021-06-22 13:00:00.000000	2021-06-22
7	7	3	8	2021-06-22 14:00:00.000000	2021-06-22
8	8	3	9	2021-06-22 15:00:00.000000	2021-06-22
9	9	4	10	2021-06-22 12:00:00.000000	2021-06-22

Entity Relationsship Diagram
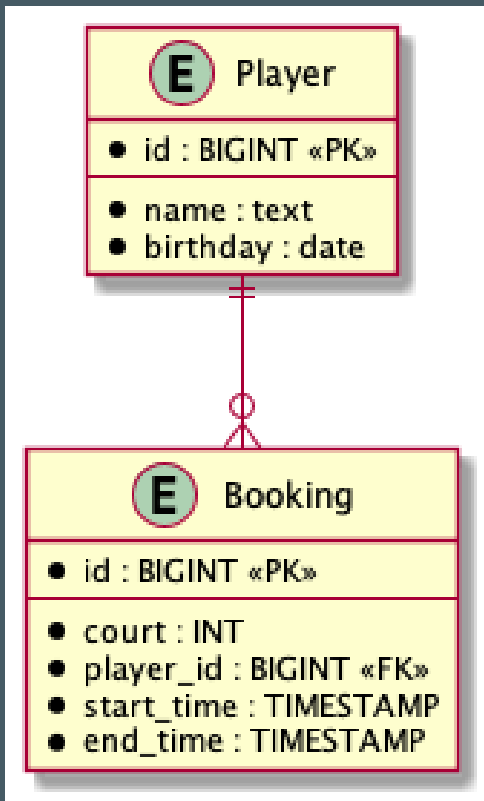
Key Concepts and Terms

- Primary key

- Foreign key

- Many to one: Children -> Mother

- Many to many: Student <-> Teacher

- One to many: Mother -> Children

Question: What relationship has "parents - children"?

ACID

ACID is a feature of database transactions intended to guarantee data validity.

- Atomicity: Transaction is a single unit
- Consistency: Data wont get corrupt by your transaction
- Isolation: Concurrent transactions do not influence each other
  - Conflicts are possible and strategies exist (concurrency control mechanisms) to avoid them
- Durability: Survive power outage