Queries in SQL

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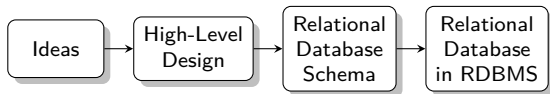
Outline

Overview

```
┌─────────┐   ┌──────────────┐   ┌──────────────┐   ┌──────────────┐
│         │   │              │   │  Relational  │   │  Relational  │
│  Ideas  │ → │  High-Level  │ → │   Database   │ → │   Database   │
│         │   │    Design    │   │    Schema    │   │   in RDBMS   │
└─────────┘   └──────────────┘   └──────────────┘   └──────────────┘
```

Outline

Introduction to SQL

SQL (pronounced as "sequel") is the principal language used to describe and manipulate relational database, and has several aspects:

▶ Data definition language (DDL).

  ▶ SQL includes commands to create database objects such as tables, indexes, and views, as well as commands to define access rights to those database objects.

  ▶ Topics of this lecture: SQL commands to create database tables (relations)

▶ Data manipulation language (DML).

  ▶ SQL includes commands to insert, update, delete, and retrieve data within the database tables.

▶ Transaction control language (TCL).

  ▶ The DML commands in SQL are executed within the context of a transaction.

▶ Data control language (DCL).

  ▶ Data control commands are used to control access to data objects.

Outline

Queries to SQL

A SQL can be understood as a relational algrebra query

Selection in SQL

Use

SELECT *
FROM R
WHERE C ;

which is

$$\sigma_C(R) \tag{1}$$

SELECT *
FROM Movies
WHERE studioName ='Disney' **AND** **year** =1990;

Projection in SQL

Use

SELECT L
FROM R
WHERE C ;

which is

$$\pi_L(\sigma_C(R)) \tag{2}$$

SELECT title , length
FROM Movies
WHERE studioName ='Disney' **AND year** =1990;

Value Comparison

For numeric and string values, we use operators

- $=$
- $<$
- $<=$
- $>$
- $>=$

String Pattern Matching

```
s LIKE p
```

How to write p? To use two special characters

- ▶ % in p matches any sequence of 0 or more characters in s
- ▶ _ in p matches any one character in s

```sql
SELECT title
FROM Movies
WHERE title LIKE 'Star ____';
```

```sql
SELECT title
FROM Movies
WHERE title LIKE '%''s%';
```

What might be the results?

Product and Join

To be continued ...