

Data Analytics Project

19. Relational Databases Structure



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Introduction

1. **The Database Schema:** Understanding the structure of relational databases is **essential** for effective data management.
2. **Relational Structure:** Tables organize data into rows and columns, each representing unique records and attributes.
3. **Schema Definition:** Defines how data is organized within database tables, including fields, records, and relationships.

Components of DB Schema

Table: Represents data in a row & column format.

Rows: Unique record within the database.

Columns: A specific attribute or field.

Field: Attributes of an individual record.

Column headings in the table are called fields.

Eg.: MovieID, title, year, ratings, etc.

Record: Collection of related attributes for an individual item.

Each row in the table represents a record.

Eg.: Storing the movie "titans" as a record.

Understanding DB Schema

Schema Importance: Defines fields, records, record keys, relationships, and data types within tables.

Effective Data Management: Essential for querying, analyzing, and managing data effectively.

Understanding schema facilitates complex queries and ensures data integrity and consistency.

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Understanding DB Relationships

1. In relational databases, data is spread across multiple tables, with relationships between them allowing for data reconstruction.
2. Relationships ensure data integrity and avoid redundancy by linking related information across tables.



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Databases Primary & Foreign Keys

Primary Key:

A field in a table containing unique identifiers for each record.

It can be a single column or a combination of columns.

Example: "*movield*" in the "*movies*" table serves as the primary key.

Foreign Key:

A column in a table that corresponds to the primary key in another table.

Establishes relationships between tables.

Example: "*movield*" in the "*gross_income*" table acts as a foreign key & refers to the *movies* table.

Database Relationships

1. **One-to-One (1:1)**: Each record in one table is linked to only one record in another table, and vice versa.
2. **One-to-Many (1:n)**: Each record in one table can relate to multiple records in another table, but each record in the second table can link to only one record in the first table.
3. **Many-to-Many (n:n)**: Multiple records in one table can connect to multiple records in another table.

Data Types in DB

1. **CHAR(size)**: Fixed-length string of characters up to 255 characters.
2. **VARCHAR(size)**: Variable-length string of characters up to 65,535 characters.
3. **TEXT**: Used for handling long-form string text content.
4. **INT**: Numeric field for positive or negative integers.
5. **DECIMAL**: Exact, fixed-point numeric field for decimal numbers.
6. **FLOAT**: Numeric field for floating-point numbers.
7. **DATETIME**: Date and time combination in standardized formats. (**YYYY-MM-DD hh:mm:ss**)

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