Lesson31

Databases. Relations and SQL

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Database relations

- When we speak “table” in term of database we actually means a “relation”
- The term relation is used for data table with few additional characteristics
- RDBMS - Relational Database Management System

The Rules of Relations

Relations

- Cells contain single values (values are atomic)
- Columns store a single type of information
- Column names are unique
- Order is insignificant
- Rows (Records, Tuples) are unique

SQL language

Structured Query Language

- SQL is used for interacting with RDBMS
- Perform CRUD operations and other administrative tasks
- Used to define tables and structures
- Different types of RDBMS (MySQL, MS SQL, Oracle and others) use slightly different implementation of SQL language, but they are all follow common SQL specifications
- A request to database with SQL commands is called sql query or statement
- Each query can consist of number of other queries that usually called subqueries

SQL Query

MySql

- SQL statment /query begins with keyword and ends with semicolon “;” which means the end of the query.
- Statements are not case sensitive
- Table name may be case sensitive (depends on configuration or OS (win/linux))
- Single line comments - - this is sql comment
- Multiline comments /* multiline comment */

Syntax Examples

- SELECT * FROM Album WHERE Label = ‘Columbia’;
- SELECT COUNT(*) FROM Album WHERE Label = ‘Columbia’;
- Functions to perform a specific operations on data used after SELECT - as above COUNT(*)
- Can contain logical and math expressions
- SELECT 5*3;

SELECT

- The SELECT Statement used for most of data retrieval in SQL
- Also used to display a result of almost any SQL query
- SELECT id, username FROM employees WHERE id=1;
- Display values for id and username columns for record with *id=1*
- SELECT * FROM employees WHERE id=1;
- “*” - asterisk for all columns in table
- *employees* - table name
- WHERE id=1 - condition

UPDATE

- The UPDATE query used to update the selected column(or columns
- UPDATE *employees* SET *email*=“john@app.com” AND firstname=“John” WHERE *id*=1;
- employees - table name
- Email - field to update
- id=1 - update condition

INSERT

- With INSERT query we add new record(row) to the table
- Primary key (auto-increment) values inserted as NULL
- INSERT INTO employees VALUES (NULL, “john”, “Doe”, ‘2020-01-01’, NULL, NULL);
- Note: to be able to insert NULL value into the field it should be tick as “Allow NULL” in Table Columns options

DELETE

- Permanent delete (no default/easy options for recovery) of record or records.
- DELETE FROM employees WHERE id = 1;
- Remove one record with id 1 from employee tables
- DELETE FROM employees WHERE birthdate = ‘2020-01-01’ AND gender=1;
- Remove all records where birthdate is ‘2020-01-01’ and gender=1