DML - Data Manipulation Language

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Data Manipulation Language

- Data Manipulation Language are languages and commands that deal with manipulating data in the database.
- It’s used to retrieve, add, update, and delete records in a table in a database.
- In sql, these commands are SELECT, UPDATE, INSERT, and DELETE.

SELECT

- Retrieve a result set of records from one or more tables. Through the use of clauses, this data can be filtered or customized as desired.
- The most frequently used statement in SQL
- Format:
  - SELECT DISTINCT columns
    FROM table
    JOIN table2
    WHERE [condition]
    GROUP BY column
    HAVING [condition2]
    ORDER BY column [ASC/DESC]
    LIMIT count
- Example:
  - SELECT id, name FROM customer, WHERE id < 10

Logical Order of Operations

1. FROM - Determines the working table(s)
2. JOIN - Used to combine tables together
3. WHERE - Applies constraint to individual rows and discards any that don’t mean them
4. GROUP BY - Groups together rows based on common values
5. HAVING - Discards grouped row (if applicable) if they do not meet the constraints
    a. Must have GROUP BY in query in order to use HAVING
6. SELECT - Get rows that are produced by above clauses
7. DISTINCT - Discards any rows with duplicate values
8. ORDER BY - Sort the data in either ascending / descending order by the specified data
9. LIMIT - Discards any rows past a certain amount
10. OFFSET - Skips the first number of offset rows in the set
    a. Slow and does not exist in the version we use

UPDATE

- UPDATE Modifies existing records in a table in database

Update Query Format

- UPDATE table_name
  SET column1 = value1, column2 = value2, columnN = valueN
  WHERE [condition];

Example

- UPDATE CUSTOMERS
  SET ADDRESS = 'New York', SALARY = 10000.00;

- Update needs a Where clause, otherwise every column would be updated.

INSERT

- Used to add new records to tables in database.

Insert Query Format

- INSERT INTO table_name (column_1, column_2, column_3, … columnN) VALUES (value1, value2, value3, … valueN);

- If adding all the values, you do not need to specify the columns, but the values need to be in the same order as the columns of the table.

- INSERT INTO TABLE_NAME VALUES (value1,value2,value3,...valueN);

Example

- INSERT INTO CUSTOMERS (ID,NAME,AGE,ADDRESS,SALARY) VALUES (1, 'John', 32, 'Smith', 2000.00);

DELETE

- Removes existing records from table in database.

- **Delete Query Format**
  DELETE FROM table_name
  WHERE [condition];

- **Example**
  DELETE FROM CUSTOMERS
  WHERE ID = 6;

- To delete all records from table, the command is
  DELETE FROM table_name;
  So be careful to put conditions

Performance

Performance or time to execute sql queries is based on how many calculations DBMS will perform.

- More Records, more time to execute query
- Joins that increase the number of records
- Aggregations require more computation
- Avoid using GROUP BY, ORDER BY, and DISTINCT to reduce time