

Tuần 1: Ngôn ngữ SQL và PostgreSQL Database

Trong chủ đề này chúng ta sẽ tìm hiểu các kiến thức cơ bản về cơ sở dữ liệu, các thao tác truy vấn dữ liệu bằng ngôn ngữ truy vấn dữ liệu có cấu trúc SQL (Structured Query Language) và cách thực thi chúng trong hệ quản trị cơ sở dữ liệu PostgreSQL

1. Cơ sở dữ liệu:

<https://www.javatpoint.com/what-is-database>

2. PostgreSQL

2.1 Hệ quản trị cơ sở dữ liệu PostgreSQL

[What is PostgreSQL? \(postgresqltutorial.com\)](https://www.postgresqltutorial.com/what-is-postgresql/)

2.2 Tải postgresql cho Windows

[Install PostgreSQL \(postgresqltutorial.com\)](https://www.postgresqltutorial.com/install-postgresql/)

2.3 Tải sample database

[PostgreSQL Sample Database \(postgresqltutorial.com\)](https://www.postgresqltutorial.com/postgresql-sample-database/)

2.4 Kết nối database

[Connecting to PostgreSQL Database Server \(postgresqltutorial.com\)](https://www.postgresqltutorial.com/connecting-to-postgresql-database-server/)

2.5 load sample database

[Load PostgreSQL Sample Database \(postgresqltutorial.com\)](https://www.postgresqltutorial.com/load-postgresql-sample-database/)

3. Các thao tác với dữ liệu

3.1 Lấy Dữ Liệu

3.1.1 SELECT

[PostgreSQL SELECT \(postgresqltutorial.com\)](https://www.postgresqltutorial.com/postgresql-select/)

3.1.2 ORDER BY

[PostgreSQL ORDER BY \(postgresqltutorial.com\)](https://www.postgresqltutorial.com/postgresql-order-by/)

3.1.3 DISTINCT

[PostgreSQL SELECT DISTINCT \(postgresqltutorial.com\)](https://www.postgresqltutorial.com/postgresql-select-distinct/)

3.2 Lọc dữ liệu đã lấy được

3.2.1 WHERE

[PostgreSQL WHERE: Filtering Rows of a Query \(postgresqltutorial.com\)](https://www.postgresqltutorial.com/postgresql-where-filtering-rows-of-a-query/)

3.2.2 AND

[PostgreSQL AND Operator \(postgresqltutorial.com\)](https://www.postgresqltutorial.com/postgresql-and-operator/)

3.2.3 OR

[PostgreSQL OR Operator \(postgresqltutorial.com\)](https://www.postgresqltutorial.com/postgresql-or-operator/)

3.2.4 LIMIT

[PostgreSQL LIMIT Clause \(postgresqltutorial.com\)](https://www.postgresqltutorial.com/postgresql-limit-clause/)

3.2.5 FETCH

[PostgreSQL FETCH NEXT n ROWS ONLY OFFSET m ROWS \(postgresqltutorial.com\)](https://www.postgresqltutorial.com/postgresql-fetch-next-n-rows-only-offset-m-rows/)

3.2.6 IN

[PostgreSQL IN - Matching Against a List of Values \(postgresqltutorial.com\)](https://postgresqltutorial.com/postgresql-in/)

3.2.7 BETWEEN

[PostgreSQL BETWEEN \(postgresqltutorial.com\)](https://postgresqltutorial.com/postgresql-between/)

3.2.8 LIKE

[PostgreSQL LIKE Operator \(postgresqltutorial.com\)](https://postgresqltutorial.com/postgresql-like/)

3.2.9 IS NULL

[PostgreSQL IS NULL \(postgresqltutorial.com\)](https://postgresqltutorial.com/postgresql-is-null/)

3.3 Nối bảng

[PostgreSQL Joins: A Visual Explanation of PostgreSQL Joins \(postgresqltutorial.com\)](https://postgresqltutorial.com/postgresql-joins/)

3.3.1 ALIASES

[PostgreSQL Table Aliases \(postgresqltutorial.com\)](https://postgresqltutorial.com/postgresql-table-aliases/)

3.3.2 INNER JOIN

[PostgreSQL INNER JOIN \(postgresqltutorial.com\)](https://postgresqltutorial.com/postgresql-inner-join/)

3.3.3 LEFT JOIN

[PostgreSQL LEFT JOIN \(postgresqltutorial.com\)](https://postgresqltutorial.com/postgresql-left-join/)

3.3.4 RIGHT JOIN

[PostgreSQL RIGHT JOIN \(postgresqltutorial.com\)](https://postgresqltutorial.com/postgresql-right-join/)

3.3.5 SELF JOIN

[PostgreSQL Self-join By Practical Examples \(postgresqltutorial.com\)](https://postgresqltutorial.com/postgresql-self-join/)

3.3.6 FULL OUTER JOIN

[PostgreSQL FULL OUTER JOIN \(postgresqltutorial.com\)](https://postgresqltutorial.com/postgresql-full-outer-join/)

3.3.7 CROSS JOIN (Optional)

[PostgreSQL CROSS JOIN \(postgresqltutorial.com\)](https://postgresqltutorial.com/postgresql-cross-join/)

3.3.8 NATURAL JOIN (Optional)

[PostgreSQL NATURAL JOIN Explained By Example \(postgresqltutorial.com\)](https://postgresqltutorial.com/postgresql-natural-join/)

3.4 Group data

[PostgreSQL GROUP BY Clause \(postgresqltutorial.com\)](https://postgresqltutorial.com/postgresql-group-by/)

[PostgreSQL HAVING \(postgresqltutorial.com\)](https://postgresqltutorial.com/postgresql-having/)

[PostgreSQL GROUPING SETS \(postgresqltutorial.com\)](https://postgresqltutorial.com/postgresql-grouping-sets/)

[PostgreSQL CUBE \(postgresqltutorial.com\)](https://postgresqltutorial.com/postgresql-cube/)

[PostgreSQL ROLLUP \(postgresqltutorial.com\)](https://postgresqltutorial.com/postgresql-rollup/)

3.5 Set operation

[PostgreSQL UNION Operator \(postgresqltutorial.com\)](https://postgresqltutorial.com/postgresql-union/)

[PostgreSQL INTERSECT Operator \(postgresqltutorial.com\)](https://postgresqltutorial.com/postgresql-intersect/)

[PostgreSQL EXCEPT \(postgresqltutorial.com\)](https://postgresqltutorial.com/postgresql-except/)

3.6 Common Table Expression (Optional)

[PostgreSQL Common Table Expression \(CTE\) \(postgresqltutorial.com\)](https://postgresqltutorial.com/postgresql-cte/)

[PostgreSQL Recursive Query \(postgresqltutorial.com\)](https://postgresqltutorial.com/postgresql-recursive-query/)

3.7 Sửa dữ liệu

[PostgreSQL INSERT \(postgresqltutorial.com\)](https://www.postgresqltutorial.com/postgresql-insert/)

[PostgreSQL INSERT - Inserting Multiple Rows into a Table \(postgresqltutorial.com\)](https://www.postgresqltutorial.com/postgresql-insert-multiple-rows/)

[PostgreSQL UPDATE Statement \(postgresqltutorial.com\)](https://www.postgresqltutorial.com/postgresql-update/)

[PostgreSQL UPDATE Join with Practical Examples \(postgresqltutorial.com\)](https://www.postgresqltutorial.com/postgresql-update-join/)

[PostgreSQL DELETE Statement \(postgresqltutorial.com\)](https://www.postgresqltutorial.com/postgresql-delete/)

[PostgreSQL DELETE JOIN - How to Emulate it Correctly \(postgresqltutorial.com\)](https://www.postgresqltutorial.com/postgresql-delete-join/)

[PostgreSQL UPSERT Statement \(postgresqltutorial.com\)](https://www.postgresqltutorial.com/postgresql-upsert/)

[PostgreSQL MERGE Statement \(postgresqltutorial.com\)](https://www.postgresqltutorial.com/postgresql-merge/)

3.8 Transaction

[PostgreSQL Transaction \(postgresqltutorial.com\)](https://www.postgresqltutorial.com/postgresql-transaction/)

4. Quản lý bảng

[PostgreSQL CREATE TABLE Statement \(postgresqltutorial.com\)](https://www.postgresqltutorial.com/postgresql-create-table/)

[PostgreSQL SELECT INTO Statement by Practical Examples \(postgresqltutorial.com\)](https://www.postgresqltutorial.com/postgresql-select-into/)

[PostgreSQL CREATE TABLE AS Statement By Examples \(postgresqltutorial.com\)](https://www.postgresqltutorial.com/postgresql-create-table-as/)

[Using PostgreSQL SERIAL to Create Auto-increment Columns \(postgresqltutorial.com\)](https://www.postgresqltutorial.com/postgresql-serial/)

[PostgreSQL Sequences \(postgresqltutorial.com\)](https://www.postgresqltutorial.com/postgresql-sequences/) (Optional)

[PostgreSQL Identity Column \(postgresqltutorial.com\)](https://www.postgresqltutorial.com/postgresql-identity-column/) (Optional)

[PostgreSQL Generated Columns \(postgresqltutorial.com\)](https://www.postgresqltutorial.com/postgresql-generated-columns/) (Optional)

[PostgreSQL ALTER TABLE \(postgresqltutorial.com\)](https://www.postgresqltutorial.com/postgresql-alter-table/)

[PostgreSQL Rename Table \(postgresqltutorial.com\)](https://www.postgresqltutorial.com/postgresql-rename-table/)

[PostgreSQL ADD COLUMN: Add One or More Columns to a Table \(postgresqltutorial.com\)](https://www.postgresqltutorial.com/postgresql-add-column/)

[PostgreSQL DROP COLUMN \(postgresqltutorial.com\)](https://www.postgresqltutorial.com/postgresql-drop-column/)

[PostgreSQL Change Column Type \(postgresqltutorial.com\)](https://www.postgresqltutorial.com/postgresql-change-column-type/)

[PostgreSQL RENAME COLUMN \(postgresqltutorial.com\)](https://www.postgresqltutorial.com/postgresql-rename-column/)

[PostgreSQL DROP TABLE \(postgresqltutorial.com\)](https://www.postgresqltutorial.com/postgresql-drop-table/)

[PostgreSQL Temporary Table \(postgresqltutorial.com\)](https://www.postgresqltutorial.com/postgresql-temporary-table/) (Optional)

[PostgreSQL TRUNCATE TABLE \(postgresqltutorial.com\)](https://www.postgresqltutorial.com/postgresql-truncate-table/)

5. Constrain

[PostgreSQL Primary Key \(postgresqltutorial.com\)](https://www.postgresqltutorial.com/postgresql-primary-key/)

[PostgreSQL Foreign Key \(postgresqltutorial.com\)](https://www.postgresqltutorial.com/postgresql-foreign-key/)

[PostgreSQL CHECK Constraints \(postgresqltutorial.com\)](https://www.postgresqltutorial.com/postgresql-check-constraints/)

[PostgreSQL UNIQUE Constraint \(postgresqltutorial.com\)](https://www.postgresqltutorial.com/postgresql-unique-constraint/)

[PostgreSQL NOT NULL Constraints \(postgresqltutorial.com\)](https://www.postgresqltutorial.com/postgresql-not-null-constraints/)

[PostgreSQL DEFAULT Value \(postgresqltutorial.com\)](https://www.postgresqltutorial.com/postgresql-default-value/)

6. Datatype (Chỉ học những data types phổ biến của SQL language)

1. BIT
2. BOOLEAN
3. CHAR
4. DATE
5. DATETIME
6. DECIMAL
7. ENUM
8. INT
9. JSON
10. TIME
11. TIMESTAMP
12. VARCHAR

ĐỌC THÊM: [SQL Functions \(Aggregate and Scalar Functions\) - GeeksforGeeks](#)

ĐỌC THÊM: [Data & Database Normalization Explained: How To Normalize Data | Splunk](#)