

Clarusway



# Backend Workshop -1-

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## Workshop

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### Subject:

- Introduction to Backend Development

### Learning Goals

- Having general information about the backend.

### Introduction

- As developers, we should also be able to express what we know. This study was prepared to support this purpose.

### Prerequisites

- We will use the VSCode you are familiar with.
- At the same time, we need to install Nodejs on our computer.

# Lets start

## 1. What Is Backend Development ?

Answer:

Backend development covers server-side web application logic and integration and activities, like writing APIs, creating libraries, and working with system components instead of frontend development, which focuses on customer-facing services and programs. Backend developers build code that allows a database and an application to communicate with one another. Backend developers take care and maintain the backend of a website, including databases, servers, and apps, and they control what you don't see.

## 2. What is skills a backend developer must have ?

Answer:

- Back-End Programming Language
- Knowledge of Front-End Technology
- Knowledge of Backend Frameworks
- Version Control System
- Knowledge of Databases
- Knowledge of API

It would be nice to have these

- Server Handling
- Data Structures and Algorithms
- Problem Solving
- Communication Skills

## 3. Why backend is important ?

Answer:

Backend development in the software development describe the programming and coding behind the user interface. Backend includes all of the functionality that happens on the server side, such as

- database interactions,

- business logic,
- routing.
- building the APIs
- services all of these that make up the backbone of web and mobile applications.

#### 4.What is SQL?

Answer: SQL (Structured Query Language) is a language used to manage and manipulate relational databases. SQL is used to create database queries, insert, update, delete data, and alter database structures.

#### 5. What is JOIN and what are its types?

Answer: JOIN is used to combine rows from two or more tables based on a related column. The main types of JOIN are:

- INNER JOIN: Returns only the matching rows between the tables.
- LEFT (OUTER) JOIN: Returns all rows from the left table and the matching rows from the right table.
- RIGHT (OUTER) JOIN: Returns all rows from the right table and the matching rows from the left table.
- FULL (OUTER) JOIN: Returns matching rows as well as non-matching rows from both tables.

#### 6.What is the difference between WHERE and HAVING clauses in SQL?

Answer:

- WHERE: The WHERE clause is used to filter records before any groupings are made. It applies to individual rows.
- HAVING: The HAVING clause is used to filter records after the groupings are made. It applies to groups of rows created by the GROUP BY clause.
- Using WHERE to filter individual rows `SELECT employee_id, name, department FROM employees WHERE salary > 5000;`
- Using HAVING to filter groups of rows `SELECT department, AVG(salary) AS average_salary FROM employees GROUP BY department HAVING AVG(salary) > 5000;`

In this example, the WHERE clause filters employees with a salary greater than 5000, while the HAVING clause filters departments with an average salary greater than 5000.

#### 7. What is the difference between WHERE and HAVING clauses in SQL?

Answer:

- GROUP BY: Used to group rows that have the same values in specified columns into summary rows.
- HAVING: Used to filter records that work on summarized GROUP BY results.
- SELECT department, COUNT() FROM employees GROUP BY department HAVING COUNT() > 10;

## 8. What is the difference between PRIMARY KEY and FOREIGN KEY?

Answer:

- PRIMARY KEY: A field (or combination of fields) that uniquely identifies each record in a table. Each table can have only one primary key, and it cannot contain null values.
- FOREIGN KEY: A field (or combination of fields) in one table that uniquely identifies a row of another table. It is used to establish and enforce a link between the data in the two tables.

## 9. What is SQL Injection and how can it be prevented?

Answer: SQL Injection is a code injection technique that exploits a security vulnerability in an application's software by manipulating SQL queries. It can be prevented by:

- Using parameterized queries
- Using ORM (Object-Relational Mapping) tools
- Validating and sanitizing inputs
- Using prepared statements

## 10. What is an INDEX in SQL and why is it used?

Answer: An INDEX is a data structure that improves the speed of data retrieval operations on a database table at the cost of additional space and slower write operations. Indexes are used to quickly locate data without having to search every row in a database table.