Clarusway

Backend Workshop -1-

Workshop

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:

Bakend 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.