ANGULAR VS REACT AND DSA

ANGULAR VS REACT:-

Feature	Angular	React
Type	Full-fledged framework	Library for UI development
Language	TypeScript	JavaScript (with JSX)
Architecture	MVC (Model-View-Controller)	Component-based
Learning Curve	Steeper (due to TypeScript, RxJS, and advanced concepts)	Easier (if familiar with JavaScript)
Performance	Slower for complex applications due to two-way data binding	Faster with Virtual DOM and one-way data flow
DOM Manipulation	Real DOM	Virtual DOM
Data Binding	Two-way data binding	One-way data binding
State Management	Built-in services & RxJS	Requires external libraries like Redux, Zustand, or Context API
Routing	Built-in router	React Router (external package)
Component Reusability	Higher due to structured framework	Flexible but requires external solutions for structure
Community & Ecosystem	Backed by Google, used for enterprise apps	Backed by Meta (Facebook), widely used in startups and scalable apps
Best For	Large-scale enterprise apps	Single-page applications (SPA) and interactive UIs
Build Tool	Angular CLI	Vite, Webpack, or Create React App (CRA)

Model View Controller:-

MVC is a **software design pattern** used to organize code in a structured way, especially in **web applications**. It separates an application into **three interconnected components**:

1. **Model** (Data & Logic)
2. **View** (User Interface)
3. **Controller** (Handles User Input, Acts as a **middleman** between **Model** and **View**.)

How MVC Works (Step-by-Step)

1. **User interacts** with the application (e.g., clicks a button).
2. **Controller** processes the request and retrieves data from the **Model**.
3. **Model** fetches the data (e.g., from a database).
4. **Controller** sends the data to the **View**.
5. **View** displays the updated UI to the user.

Data binding:-

Data binding is a way to connect your application's UI (what the user sees) with the data behind it (stored in variables or a database). It ensures that when the data changes, the UI updates automatically, and vice versa.

What is the DOM (Document Object Model)? :-

The **DOM (Document Object Model)** is a **programming interface** that represents a webpage as a **tree structure**. It allows **JavaScript** and other languages to **interact with HTML & CSS dynamically**.

1. The **browser loads** an HTML page.
2. It creates a **DOM tree** that represents all **HTML elements** as objects.
3. JavaScript can **modify, add, or remove** elements dynamically.
4. Changes in the DOM **reflect instantly** on the webpage.

5 Steps of Virtual DOM:-

1. **Render the Virtual DOM**: React creates an in-memory representation of the UI.
2. **Detect Changes**: When state/props change, React generates a new Virtual DOM.
3. **Compare the Virtual DOMs**: React finds differences between the old and new Virtual DOM.
4. **Update the Real DOM Efficiently**: React updates only the changed elements.

5️⃣ **Commit & Repaint**: The browser updates the UI smoothly.

Data Structures using python:-

1.Stack
2.Copying one stack to other without using a third stack
3.Implementation of Binary tree and various traversal methods
4.Binary Search Trees
5.Using tries to search for a word in a database