React Workshop

By TOP ENGINEERS

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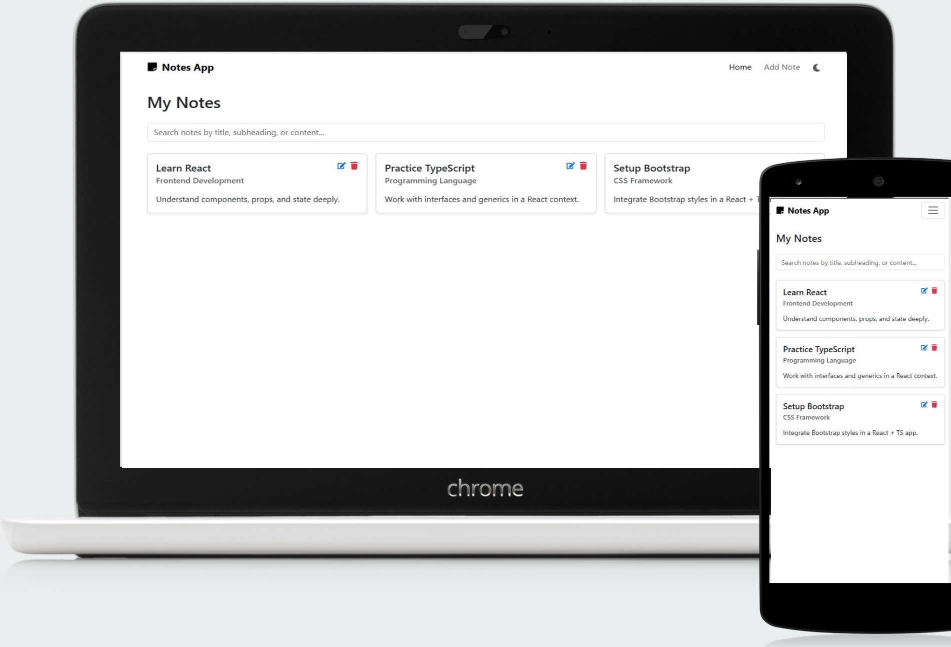
UPGRADING ENGINEERING VERSION



Notes App

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Learn React
Frontend Development
Understand components, props, and state deeply.

Practice TypeScript
Programming Language
Work with interfaces and generics in a React context.

Setup Bootstrap
CSS Framework
Integrate Bootstrap styles in a React + T

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Prerequisite

Install VS Code	https://code.visualstudio.com/download
Install Git	https://git-scm.com/install
Vercel	https://vercel.com
Git Hub	https://github.com
Install Node	https://nodejs.org/en/download

Why Frontend Development? And Where it stands:

- Frontend is what users directly interact with
- It focuses on user experience, usability, and design
- Connects visual interface to backend systems
- Defines how users perceive and navigate digital products
- Sits between UI design and backend logic.
- Acts as a bridge converting business logic into user actions

React, Angular, and Vue

- Each solves frontend challenges differently
- Angular and Vue are frameworks: full ecosystem for routing, state, forms, etc
- React is a library: focused only on UI, gives freedom to pick other tools
- Angular = opinionated and structured
- React = flexible and modular
- Vue = balanced between simplicity and structure

JSX and How React Handles It

- JSX = JavaScript XML: allows writing HTML in JavaScript
- Transpiled by Babel into React.createElement() calls
- Enables declarative UI building

Example:

const element = <h1>Hello, world!</h1>

React converts this into efficient virtual DOM elements

State

- Passed from parent to child components
- Simiilar to Function Args
- Immutable - Read-only
- Used for component configuration

Props

- Managed within the component
- Similar to local variables
- Mutable - changes trigger re-render
- Used to track dynamic data or UI updates

React Hooks

Introduced in React 16.8 to use state and lifecycle features in functional components

- **useState**: Manage local state
- **useEffect**: Handle side effects (like fetching data)
- **useContext**: Access global context
- **useRef**: Reference DOM elements
- **useMemo** & **useCallback**: Optimize performance
- **Custom Hooks**: Created by combining existing hooks for reusable logic

Bootstrap

- CSS framework for responsive design
- Uses grid system (rows, columns)
- Predefined utility classes for margin, padding, typography
- Makes UI development faster and consistent

Example classes

- ➔ *.container, .row, .col*
- ➔ *.btn, .btn-primary*
- ➔ *.text-center, .mt-3*

React Context and Providers

- Context helps pass data across components without prop drilling
- Provider makes data available to its descendants
- Consumer (or useContext) reads the data

Example

const MyContext = React.createContext();

<MyContext.Provider value={data}>...</MyContext.Provider>

Web Communication & REST APIs

- Frontend communicates with backend via APIs
- REST = Representational State Transfer
- Stateless communication using HTTP methods
- Frontend sends requests; backend responds with JSON/XML
- Enables data fetching, posting, updating, and deletion

HTTP Methods (REST API)

- GET → Retrieve data
- POST → Create new resource
- PUT → Update existing resource
- PATCH → Partially update resource
- DELETE → Remove resource

Questions?

Thank You

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