

React JS

1. Introduction to React

- What is React?
 - Benefits of using React
 - Understanding Single Page Applications (SPA)
 - Comparison with other frameworks (Angular, Vue)
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2. Environment Setup

- Installing Node.js and npm
 - Create React App (CRA) and Vite
 - Project structure overview
 - Running your first React app
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3. Core Concepts

- JSX Syntax
- Components: Functional vs Class
- Props and Prop Drilling
- State Management (useState)
- Event Handling

4. React Hooks

- `useState`
- `useEffect`
- `useContext`
- `useRef`
- `useMemo` and `useCallback`
- Custom Hooks

5. Component Communication

- Parent to Child (props)
 - Child to Parent (callbacks)
 - Sibling Communication
 - Context API for global state
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6. Forms and Validations

- Controlled vs Uncontrolled Components
 - Handling form inputs
 - Form validation using:
 - Native validation
 - Libraries like Formik & Yup
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7. Routing in React

- React Router v6+
 - Navigation & Redirects
 - Nested Routes
 - Route Params and useParams
 - Private Routes
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8. State Management Solutions

- Lifting State Up
 - Context API
 - Redux (Toolkit)
 - Zustand or Recoil (optional)
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9. Side Effects and Data Fetching

- `useEffect` for API calls
 - Fetch API / Axios
 - Handling loading and error states
 - Async/Await usage
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10. Styling in React

- CSS Modules
 - Styled-components
 - Tailwind CSS
 - MUI (Material UI)
 - Conditional Styling
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11. Performance Optimization

- Memoization (`React.memo`, `useMemo`, `useCallback`)
 - Lazy Loading Components (`React.lazy`, `Suspense`)
 - Code Splitting
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13. Deployment (Optional)

- Building React App
 - Hosting on Vercel / Netlify / GitHub Pages
 - Environment Variables
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14. Advanced Topics (Optional)

- Server-Side Rendering (Next.js Basics)
 - Progressive Web Apps (PWA)
 - React with TypeScript
 - React Query or SWR
 - Micro Frontends (Module Federation)
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15. Final Project

- Develop a real-world application:
 - E-commerce App
 - Chat App
 - Dashboard with CRUD operations