GitHub Copilot React Development

Prerequisites: Strong Knowledge of JS ES6 Programming

Day 1: Introduction to React and GitHub Copilot

Introduction to React

- Overview of React: Core concepts and architecture
- Setting up the React development environment
- Creating a new React application using Create React App (CRA)

GitHub Copilot Basics

- Introduction to GitHub Copilot: Features, setup, and integration
- Configuring GitHub Copilot in your IDE (e.g., Visual Studio Code)
- Basic usage: Generating code snippets, components, and hooks with Copilot

Developing React Components with Copilot

- Creating functional and class components using Copilot
- Implementing props, state, and event handling with AI assistance
- Using Copilot to generate reusable components and custom hooks

Lab 1 - Building a Basic React Application with Copilot

- Hands-on lab: Create a simple React application
- Practice generating and refining components with GitHub Copilot
- Review and optimize the generated code for best practices

Day 2: Advanced React Concepts and Copilot Integration

State Management in React

- Understanding React's built-in state management
- Implementing useState and useReducer hooks for state management
- Using GitHub Copilot to generate state management logic

React Context API and Custom Hooks

- Using the Context API for global state management
- Creating custom hooks for reusable logic
- Leveraging GitHub Copilot to automate hook creation and context setup

Routing with React Router

- Setting up routing and navigation with React Router
- Implementing nested routes and dynamic routing
- Using GitHub Copilot to assist in routing configuration

Lab 2 - Developing Advanced React Features with Copilot

- Hands-on lab: Implement state management and routing in a React application
- Utilize GitHub Copilot to streamline development and debugging
- Test and refine the application with AI-generated suggestions

Day 3: API Integration and Performance Optimization (8 Hours)

Consuming RESTful APIs with React

- Making API calls with fetch and Axios
- Handling asynchronous operations and side effects with useEffect
- Using GitHub Copilot to generate API integration code

Performance Optimization in React

- Identifying performance bottlenecks in React applications
- Using memoization techniques (useMemo, useCallback) for optimization
- Leveraging GitHub Copilot to suggest performance enhancements

Error Handling and Debugging

- Implementing error boundaries and handling exceptions in React
- Debugging React applications with Chrome DevTools and React Developer Tools
- Using GitHub Copilot to assist in error handling and debugging processes

Lab 3 - API Integration and Performance Optimization

- Hands-on lab: Integrate a RESTful API and optimize performance in a React application
- Use GitHub Copilot to assist in coding and identifying performance improvements
- Test and debug the application with Copilot's suggestions

Day 4: Testing, Deployment, and Final Project

Testing React Applications

- Introduction to testing in React with Jest and React Testing Library
- Writing unit tests for components, hooks, and utilities
- Using GitHub Copilot to generate test cases and assertions

Deployment of React Applications

- Preparing React applications for production
- Deploying React apps to hosting platforms
- Automating deployment processes with GitHub Actions and Copilot