**Why Jest and RTL ?**

**Why Use Jest and React Testing Library (RTL) for White-Box Testing?**

**Jest and React Testing Library are a powerful combination for testing React applications, providing robust features and developer-friendly utilities. Here's why they are often preferred:**

**⚡ Why Choose Jest?**

* **Built for JavaScript and Typescript : Specifically designed for testing JavaScript and Typescript applications, including React.**
* **Zero Configuration: Simple setup with minimal configuration needed.**
* **Fast and Reliable: Efficient parallel test execution with detailed reports.**
* **Mocking Capabilities: Supports mocking functions, modules, and timers using jest.fn() and jest.mock().**
* **Snapshot Testing: Captures component output snapshots to detect UI changes.**
* **Code Coverage Reports: Provides insights into untested code using --coverage.**

**⚡ Why Choose React Testing Library (RTL)?**

**Using React Testing Library (RTL) with TypeScript! In fact, using TypeScript with RTL is a great choice because it provides:**

* **Type Safety: Prevents runtime errors by catching type-related issues during development.**
* **Improved Autocomplete and IntelliSense: Helps with better code suggestions in VS Code.**
* **Clearer Component Contracts: Ensures proper prop validation using TypeScript interfaces.**
* **User-Centric Testing: Tests components from the user’s perspective, not just focusing on implementation details.**
* **DOM-Based Testing: Directly interacts with the DOM, ensuring UI behaves as expected.**
* **Accessibility Focused: Encourages using accessible queries (getByRole, getByLabelText) for better test reliability.**
* **No Over-Testing: Prevents unnecessary testing of internal states or logic, promoting maintainable tests.**
* **Seamless Integration: Integrates easily with Jest and supports mocking API requests.**

**✅ Advantages of Jest and RTL**

| **Aspect** | **Jest** | **React Testing Library** |
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| **Ease of Use** | **Simple to install and configure** | **Provides easy-to-use utilities for component testing** |
| **Fast Execution** | **Supports parallel test runs for speed** | **Works efficiently by rendering components in memory** |
| **Built-in Assertions** | **Comes with robust matchers for testing** | **Extends Jest with DOM-specific matchers using jest-dom** |
| **Snapshot Testing** | **Helps in UI regression testing** | **Supports rendering snapshots for component UI tests** |
| **Mocking Support** | **Excellent support for mocks, spies, and stubs** | **Allows API call mocking using Jest functions** |
| **Accessibility Focus** | **N/A** | **Promotes accessible queries for UI testing** |
| **Code Coverage Reports** | **Generates detailed reports** | **Compatible with Jest’s coverage feature** |