Test automation is a software testing technique that uses specialized automated testing software tools to execute a set of test cases. In addition to the process of using specific software tools, it also involves comparing actual results with expected results and reporting test results. Test steps sitting in front of a computer are different from careful manual testing by a human. Test automation aims to streamline the testing process, increase efficiency, and improve the accuracy of test results.

Benefits of test automation

* Faster execution: Automated tests can be run significantly faster than manual tests, allowing for quicker feedback on the quality of the software.
* Increased test coverage: Automation allows for a broader range of tests to be executed, including repetitive and time-consuming scenarios that may be impractical to perform manually.
* Improved accuracy: Automated tests follow predefined scripts, reducing the potential for human error and ensuring consistent test execution.
* Regression testing: Automation is particularly useful for regression testing, where previously tested functionality is retested to ensure that new changes or updates haven't introduced any defects.
* Resource optimization: With automated testing, fewer human resources are required for repetitive tasks, freeing up testers to focus on more complex and exploratory testing

Automation Testing Tools

* Selenium: Selenium is an open-source automation framework widely used for web application testing. It supports multiple programming languages like Java, C#, Python, and more.
* Appium: Open-source tool for automating mobile applications across iOS, Android, and Windows platforms. It supports native, hybrid, and mobile web applications and provides a consistent API for interacting with mobile devices.
* JUnit: Popular open-source testing framework for Java applications, used for unit testing. It supports annotations for test setup, teardown, assertions, and test reporting.
* TestComplete: Commercial tool for functional testing of desktop, web, and mobile applications, featuring record-and-playback and scriptless testing. It supports multiple scripting languages such as JavaScript, VBScript, and Python.
* Ranorex: Ranorex is a commercial automation tool for desktop, web, and mobile applications. Ranorex supports multiple programming languages, including C# and VB.NET.
* Postman: A collaboration platform and API testing tool that allows designing, testing, and documenting APIs. It supports RESTful, SOAP, and GraphQL APIs, provides features like request chaining, test scripting, and comprehensive reporting.
* LoadRunner: A performance testing tool for web and mobile applications. It simulates real-life user behavior, measures system response, and identifies performance bottlenecks. Supports various protocols and offers load generation, analysis, and tuning capabilities.
* JMeter: An open-source tool for load testing and performance testing. It can simulate heavy loads on servers, networks, or objects. Supports protocols like HTTP, HTTPS, FTP, JDBC, SOAP, and offers features for test plan creation, assertions, distributed testing, and reporting.
* AppCenter Test: AppCenter Test, part of Microsoft's AppCenter suite, is a cloud-based mobile app testing tool. It supports automated UI testing for iOS and Android applications.
* SoapUI: SoapUI is an open-source tool specifically designed for testing web services and APIs. It allows creating, executing, and validating SOAP and RESTful web services. SoapUI offers features like data-driven testing, security testing, and load testing.
* Katalon Studio: Katalon Studio is a free and comprehensive test automation tool for web, API, mobile, and desktop applications. It provides a complete package of features, including recording and scripting, test case management, test data management, and integrations with various CI/CD tools.