**What is Regression Testing?**

Regression Testing is defined as a type of software testing to confirm that a recent program or code change has not adversely affected existing features. Regression Testing is nothing but a full or partial selection of already executed test cases that are re-executed to ensure existing functionalities work fine.

This testing is done to ensure that new code changes do not have side effects on the existing functionalities. It ensures that the old code still works once the latest code changes are done.

**Why Regression Testing?**

There is a **need for regression testing** whenever the code is changed, and you need to determine whether the modified code will affect other parts of the software application. Moreover, regression testing is needed when a new feature is added to the software application. Regression tests may also be performed when a functional or performance defect/issue is fixed.

**How to do Regression Testing**

In order **to do Regression Testing** process, we need to first debug the code to identify the bugs. Once the bugs are identified, required changes are made to fix it, then the regression testing is done by selecting relevant test cases from the test suite that covers both modified and affected parts of the code.

Software maintenance is an activity which includes enhancements, error corrections, optimization and deletion of existing features. These modifications may cause the system to work incorrectly. Therefore, Regression Testing becomes necessary. Regression Testing can be carried out using the following techniques:



**Retest All**

This is one of the methods for Regression Testing in which all the tests in the existing test bucket or suite should be re-executed. This is very expensive as it requires huge time and resources.

**Regression Test Selection**

Regression Test Selection is a technique in which some selected test cases from test suite are executed to test whether the modified code affects the software application or not. Test cases are categorized into two parts, reusable test cases which can be used in further regression cycles and obsolete test cases which cannot be used in succeeding cycles.

#### **Prioritization of Test Cases**

Prioritize the test cases depending on business impact, critical & frequently used functionalities. Selection of test cases based on priority will greatly reduce the regression test suite.

**Selecting test cases for regression testing**

It was found from industry data that a good number of the defects reported by customers were due to last minute bug fixes creating side effects and hence selecting the[Test Case](https://www.guru99.com/test-case.html)for regression testing is an art and not that easy.  Effective Regression Tests can be done by selecting the following test cases –

* Test cases which have frequent defects
* Functionalities which are more visible to the users
* Test cases which verify core features of the product
* Test cases of Functionalities which has undergone more and recent changes
* All Integration Test Cases
* All Complex Test Cases
* Boundary value test cases
* A sample of Successful test cases
* A sample of Failure test cases

**Regression Testing Tools**

If your software undergoes frequent changes, regression testing costs will escalate. In such cases, Manual execution of test cases increases test execution time as well as costs. Automation of regression test cases is the smart choice in such cases.  The extent of automation depends on the number of test cases that remain re-usable for successive regression cycles.

Following are the most important tools used for both functional and regression testing in software engineering:

**1) [testRigor](https://bit.ly/32ye79O" \t "_blank)**

[testRigor](https://bit.ly/32ye79O) helps you to directly express tests as executable specifications in plain English. Users of all technical abilities can build end-to-end tests of any complexity covering mobile, web, and API steps in one test. Test steps are expressed on the end-user level instead of relying on details of implementation like XPaths or CSS Selectors.

[](https://bit.ly/32ye79O)

**Features:**

* Free forever public version
* Test cases are in English.
* Unlimited users & Unlimited tests
* The easiest way to learn automation.
* Recorder for web steps
* Integrations with CI/CD and Test case management
* Email & SMS testing
* Web + Mobile + API steps in one test

**2)**[**Avo Assure**](https://guru99.link/recommends-avoautomation-regression-testing)

[Avo Assure](https://guru99.link/recommends-avoautomation-regression-testing) is a technology agnostic, no-code test automation solution that helps you test end-to-end business processes with a few clicks of the buttons. This makes regression testing more straightforward and faster.

[A picture containing shape

Description automatically generated](https://guru99.link/recommends-avoautomation-regression-testing)

**Features**

* Autogenerate test cases with a 100% no-code approach
* Test across the web, desktop, mobile, ERP applications, Mainframes, associated emulators, and more with a single solution.
* Enable accessibility testing
* Execute test cases in a single VM independently or in parallel with Smart Scheduling
* Integrate with Jira, Jenkins, ALM, QTest, Salesforce, Sauce Labs, TFS, etc.
* Define test plans and design test cases through the Mindmaps feature

**3)**[**Subject7**](https://guru99.live/wZlz6b)

[Subject7](https://guru99.live/wZlz6b) is a cloud-based, “true codeless” test automation solution that unifies all testing in a single platform and empowers anyone to become an automation expert. Our easy-to-use software enables fast, easy, and sophisticated authoring of regression tests without writing a line of code, and high scale execution that runs thousands of nightly tests.

[A picture containing text, tableware, plate, dishware

Description automatically generated](https://guru99.live/wZlz6b)

**Features:**

* Integrates easily with DevOps/Agile tooling using native plugins, in-app integrations, and open APIs.
* High-scale parallel execution in the cloud or on-prem with enterprise-grade security.
* Flexible reporting of defects, with video capture of results.
* Simple, non-metered pricing, delivering financial predictability.
* SOC2 Type2 compliant
* [**Selenium**](https://www.guru99.com/selenium-tutorial.html): This is an open-source tool used for automating web applications. Selenium can be used for browser-based regression testing.
* [**Quick Test Professional (QTP)**](https://www.guru99.com/quick-test-professional-qtp-tutorial.html): HP Quick Test Professional is automated software designed to automate functional and regression test cases. It uses[VBScript](https://www.guru99.com/vbscript-tutorials-for-beginners.html)language for automation. It is a Data-driven, Keyword based tool.
* **Rational Functional Tester (RFT)**: IBM’s rational functional tester is a[Java](https://www.guru99.com/java-tutorial.html)tool used to automate the test cases of software applications. This is primarily used for automating regression test cases and it also integrates with Rational Test Manager.

**Regression Testing and Configuration Management**

Configuration Management during Regression Testing becomes imperative in Agile Environments where a code is being continuously modified. To ensure effective regression tests, observe the following :

* Code being regression tested should be under a configuration management tool
* No changes must be allowed to code, during the regression test phase.  Regression test code must be kept immune to developer changes.
* The database used for regression testing must be isolated. No database changes must be allowed

**What is Retesting?**

Retesting is a process to check specific test cases that are found with bug/s in the final execution. Generally, testers find these bugs while testing the software application and assign it to the developers to fix it. Then the developers fix the bug/s and assign it back to the testers for verification. This continuous process is called Retesting.

**What is Regression Testing?**

Regression Testing is a type of software testing executed to check whether a code change has not unfavorably disturbed current features & functions of an Application.

**Difference between Re-Testing and Regression Testing**

Retesting means testing the functionality or bug again to ensure the code is fixed. If it is not fixed,[Defect](https://www.guru99.com/defect-management-process.html)needs to be re-opened. If fixed, Defect is closed.

Regression testing means testing your software application when it undergoes a code change to ensure that the new code has not affected other parts of the software.

**Key Difference between Retesting and Regression Testing**

* Regression testing is performed for passed test cases, while Retesting is done only for failed test cases.
* Regression testing checks for unexpected side-effects, while Re-testing makes sure that the original fault has been corrected.
* Regression testing doesn’t include defect verification, whereas Re-testing includes defect verification.
* Regression testing is known as generic testing, whereas Re-testing is planned testing.
* Regression testing is possible with the use of automation, whereas Re-testing is not possible with automation.

|  |  |
| --- | --- |
| **Regression Testing** | **Re-testing** |
| [Regression Testing](https://www.guru99.com/regression-testing.html) is carried out to confirm whether a recent program or code change has not adversely affected existing features | Re-testing is carried out to confirm the test cases that failed in the final execution are passing after the defects are fixed |
| The purpose of Regression Testing is that new code changes should not have any side effects to existing functionalities | Re-testing is done on the basis of the[Defect](https://www.guru99.com/defect-management-process.html)fixes |
| Defect verification is not the part of Regression Testing | Defect verification is the part of re-testing |
| Based on the project and availability of resources, Regression Testing can be carried out parallel with Re-testing | Priority of re-testing is higher than regression testing, so it is carried out before regression testing |
| You can do automation for regression testing, [Manual Testing](https://www.guru99.com/manual-testing.html) could be expensive and time-consuming | You cannot automate the test cases for Retesting |
| Regression testing is known as a generic testing | Re-testing is a planned testing |
| Regression testing is done for passed test cases | Retesting is done only for failed test cases |
| Regression testing checks for unexpected side-effects | Re-testing makes sure that the original fault has been corrected |
| Regression testing is only done when there is any modification or changes become mandatory in an existing project | Re-testing executes a defect with the same data and the same environment with different inputs with a new build |
| Test cases for regression testing can be obtained from the functional specification, user tutorials and manuals, and defect reports in regards to corrected problems | Test cases for retesting cannot be obtained before start testing. |

**Challenges in Regression Testing**

Following are the major testing problems for doing regression testing:

* With successive regression runs, test suites become large.  Due to time and budget constraints, the entire regression test suite cannot be executed.
* Minimizing the test suite while achieving maximum[Test coverage](https://www.guru99.com/test-coverage-in-software-testing.html)remains a challenge.
* Determination of frequency of Regression Tests, i.e., after every modification or every build update or after a bunch of bug fixes, is a challenge.

**Conclusion**

Regression Testing Meaning – Regression testing is a type of software testing that ensures an application still functions as expected after improvements, any code changes, or updates.

An effective regression strategy, save organizations both time and money. As per one of the case study in banking domain, regression saves up to 60% time in bug fixes (which would have been caught by regression tests) and 40% in money