**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 full or partial selection of already executed test cases which are re-executed to ensure existing functionalities work fine.

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

Regression testing a black box testing technique that consists of re-executing those tests that are impacted by the code changes. These tests should be executed as often as possible throughout the software development life cycle.

Types of Regression Tests:

* **Final Regression Tests: -**A "final regression testing" is performed to validate the build that hasn't changed for a period of time. This build is deployed or shipped to customers.
* **Regression Tests: -**A normal regression testing is performed to verify if the build has NOT broken any other parts of the application by the recent code changes for defect fixing or for enhancement.

**Need of Regression Testing:**

Regression Testing is required when there is a

* Change in requirements and code is modified according to the requirement
* New feature is added to the software
* Defect fixing
* Performance issue fix

**Regression Testing Techniques:**

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 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**

* Instead of re-executing the entire test suite, it is better to select part of test suite to be run
* Test cases selected can be categorized as 1) Reusable Test Cases 2) Obsolete Test Cases.
* Re-usable Test cases can be used in succeeding regression cycles.
* Obsolete Test Cases can't 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.

[**Regression testing**](http://www.softwaretestingclass.com/regression-testing-definition/) is type of testing carried out to ensure that changes made in the fixes or any enhancement changes are not impacting the previously working functionality. It is executed after enhancement or defect fixes in the software or its environment. It can be difficult to determine how much re-testing is needed, especially near the end of the development cycle.

This type of testing typically carried out by testing specialist peoples. The automated testing methods are the best and safe option to carry out the Regression testing. In the market there are many free as well as free (open source) **software testing tools** are available. In the larger software development project the Regression testing is commonly used.

**Some of the most commonly used regression testing tools list:**

* [QTP](http://www.mercury.com/us/products/)
* [Regression Tester](http://www.regressiontester.com/)
* [Selenium](http://www.openqa.org/selenium/)
* [Rational Functional Tester](http://www.ibm.com/products/us/)
* [Watir](http://www.openqa.org/watir/)
* [Winrunner](http://www.mercury.com/us/products/quality-center/functional-testing/winrunner/)
* [actiWate](http://www.actiwate.com/)
* AdventNet QEngine
* [SilkTest](http://www.borland.com/)
* vTest

It is a verification method & mainly done in system testing but it applicable to all levels of software testing (Unit testing, Integration testing, System testing and Acceptance testing.)

Good Regression tester need to aware of what all features to be focus on changes in the software application.

“The main aim of regression testing to make sure that changed component is not impacting the unchanged part of the component”.

**Types of Regression testing techniques:**We have four types of regression testing techniques. They are as follows:

**1) Corrective Regression Testing:** Corrective regression testing can be used when there is no change in the specifications and test cases can be reused.

**2) Progressive Regression Testing:** Progressive regression testing is used when the modifications are done in the specifications and new test cases are designed.

**3) Retest-All Strategy:** The retest-all strategy is very tedious and time consuming because here we reuse all test which results in the execution of unnecessary test cases. When any small modification or change is done to the application then this strategy is not useful.

**4) Selective Strategy:** In selective strategy we use a subset of the existing test cases to cut down the retesting effort and cost. If any changes are done to the program entities, e.g. functions, variables etc., then a test unit must be rerun. Here the difficult part is to find out the dependencies between a test case and the program entities it covers.

**When to use it:**

Regression testing is used when:

* Any new feature is added
* Any enhancement is done
* Any bug is fixed
* Any performance related issue is fixed

**Advantages of Regression testing:**

* It helps us to make sure that any changes like bug fixes or any enhancements to the module or application have not impacted the existing tested code.
* It ensures that the bugs found earlier are NOT creatable.
* Regression testing can be done by using the automation tools
* It helps in improving the quality of the product.

**Disadvantages of Regression testing:**

* If regression testing is done without using automated tools then it can be very tedious and time consuming because here we execute the same set of test cases again and again.
* Regression test is required even when a very small change is done in the code because this small modification can bring unexpected issues in the existing functionality.

## Selecting Regression Tests:

* Requires knowledge about the system and how it affects by the existing functionalities.
* Tests are selected based on the area of frequent defects.
* Tests are selected to include the area, which has undergone code changes many a times.
* Tests are selected based on the criticality of the features.

## Regression Testing Steps:

Regression tests are the ideal cases of automation which results in betterReturn on Investment (ROI).

* Select the Tests for Regression.
* Choose the apt tool and automate the Regression Tests
* Verify applications with Checkpoints
* Manage Regression Tests/update when required
* Schedule the tests
* Integrate with the builds
* Analyze the results