

## REGRESSION TESTING TOOLS FOR TESTING DATABASE APPLICATIONS

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**ABSTRACT:** Regression testing is the process of executing the full or partial test cases from the original test suite after any modifications to the original program. It tests both the modified code and other parts of the program that may be adversely affected by changes introduced in the program or a part of it. The database applications are frequently modified due to the need of different requirements like, increase in number of users, components and data. Therefore regression testing of database applications is an essential activity as it requires maintaining the state of the database. It may be conducted either manually by re-executing a subset of all test cases of the original test suite or using automated tools. These tools enable the software testers to capture test cases and results for subsequent playback and comparison. In this paper, we have given a brief introduction of the regression testing tools that can be helpful to fellow researchers in their research for regression testing and regression testing for database applications.

**Keywords:** Software Testing, Regression Testing, Database Applications, Regression Test Case Selection, Testing Tools.

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### 1. INTRODUCTION

Software Testing is the method of executing a program with the intent of finding failures in the program. Regression testing is a process of testing that is applied when a program is modified or some changes takes place in the software program. Testing is done after the development phase is complete and regression testing is done when the software is delivered and some changes takes place to that software. It involves testing the modified part of the program in order to gain confidence that the modified part of the program will not affect the un-modified part of the program and regression test selection is the selection of already executed test cases that can be full or partial selection of test cases from the original test suite [1]. A database-driven application involves maintaining the state of the database with the state of the program. The application programs which does not involves database are called as stateless applications and those applications which involves database are known as state-full applications. The regression testing of database applications concerns with the state of the database as it contributes too many components that increase the complexity of the applications because in case of database the test cases are not independent of each other and the database requires to be reset all the time [2]. Regression testing is a process that can be done on any Testing platforms: - Eclipse IDE, MAVEN, Net Beans, IntelliJ IDEA and Backend databases tools: - Derby, HSQLDB, MySQL, Oracle.

### 2. REGRESSION TESTING TOOLS

#### 2.1. Xored Q7 Professional

This regression tool is developed with modern integrated environment especially designed for Eclipse IDE, and let all its members speak the same language [3]. It minimizes the learning time and decrease the configuration and integrated overhead resulting in focus on the productivity.

#### 2.2. EclEmma

This is a free java code coverage tool for functional and regression testing in Eclipse IDE. It provides the complete code coverage of the program like function, statement, branch, condition coverage etc. It run the junit test cases and generates the report of coverage [4]. It also helps in automation of the coverage process.

#### 2.3. Window Tester Pro

This tool eases the creation of test cases by Automating GUI testing which maximizes the productivity of the testing team. It reduces the cost requires in manually test case creation and saves the overall the time of writing the test cases [5]. The test cases generated by this tool are the standard junit tests and can be run in Eclipse environment or by using Ant.

#### 2.4. SoapUI

This is a functional and regression testing tool. It is an open source web service testing application tool and it tests the service-oriented architectures (SOA). It is preferred from

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many available tools because of its flexibility and ease of use [6]. It tests the various secure services, connectivity servers, load and performance of the web servers.

### 2.5. Junit

This is a functional and regression testing tool which provide unit testing and code coverage of the program. It is a simple, open source framework which runs all repeatable tests [15]. It is a junit testing framework that tests for the expected results and an instance of xunit framework.

### 2.6. Quick Test Pro (QTP)

It is a functional and regression testing tool for testing software applications and their environments. It consists of deepest insights into a secure operational environment. It supports Graphical User Interface (GUI) and keyboard interfaces [9].

### 2.7. Code Coverage Pro

This tool measures the amount of code being executed and decides the need on the bases of the complexity of the code being run [10]. It evaluates all possible paths and effective test cases and consists of two mechanisms on the bases of which the needs are decided.

### 2.8. TOSCA Test Suite

It is a software tool which automates the functional and regression testing of software applications. It includes Graphical user interface (GUI), Application Programming Interface (API), and Command Line Interface (CLI). It provides the dynamic generation of test cases and executes non GUI's and GUI's tests [7].

### 2.9. Jtest

It is an integrated development testing tool for unit and regression testing of program. It significantly improves the product's consistency with decrease in the development time as well as cost and automatically creates and executes test cases [13].

## 3. TOOLS FOR REGRESSION TESTING OF DATABASE APPLICATIONS

### 3.1. Rational Functional Tester

This is an automated tool for functional and regression testing of data-driven applications. It automatically generates test cases for the application under test and lists the test objects available in that application [8]. It is a simpler test case generation tool which provides data validation, parallel development control, and lifecycle traceability.

### 3.2. Apex Code

It is a tool for regression testing of database applications. It facilitates error-free and robust code for the creation of unit test cases which comprises of classes and methods that validates the working of code properly [12]. Test methods are the critical part of development environment in this tool.

### 3.3. TestComplete

It is an automated tool that enables anyone to create, manage and run test cases in minutes. It makes test case creation simpler by means of some features that can be easily extensible [11]. It tests web and windows through total flexibility. It comes with all-in-one package as well as requires no special skills. It provides some great features and impressive resources support.

### 3.4. TestNG

It is a testing tool inspired from junit but it consists of some more features than junit in order to create regression testing simpler and easier. It also provides deeper and broader test coverage as compared to junit testing. It covers all categories of tests like: unit, integration, functional, etc...

### 3.5. DBunit

It is a regression testing tool for testing database applications. It is an extension of Junit test case class and from family of xunit framework. It is a simple tool for. It is a great unit testing for database applications as well as it allows to setup and teardown the database [2]. It also puts the database in a known state among test runs.

## 4. CONCLUSION

This paper provides a brief summary of tools available for regression testing of software applications and regression testing of database applications. The study of these tools that are reported in this paper reveals some new, important and extended features that will be very useful for our future researchers in many scenario's as well as in many state of affairs and this work will help them in studying, learning and understanding the tools that exist so far.

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