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Software testing types

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Test Types

Usability

System

GUI

Beta

Integration

Performance

Compatibility

Exploratory

Unit

White Box

Recovery

Sanity

Functional

Regression

Smoke

Install/uninstall

Confirmation

Negative

Localization

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Test Types

- ✔ Functional:
  - Installation testing
  - Smoke Testing
  - Functionality Testing
  - Compatibility testing
- ✔ Non-functional:
  - Security testing
  - Usability testing
  - Localization testing and Internationalization testing
  - Performance testing
  - Load testing
  - Stress testing
  - GUI testing
- ✔ Confirmation testing, Regression testing

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Installation testing

Installation testing, intended to check the successful installation and upgrade or remove the program.

Smoke testing

Smoke testing is performed in order to show that the most necessary functionality of the program (which requires the product).

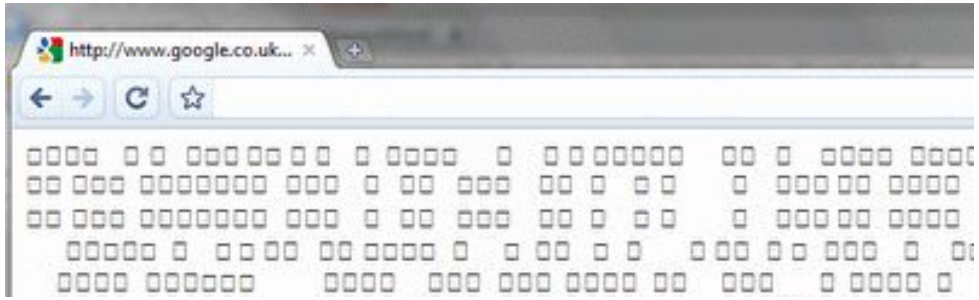
This testing is done by developers or testers.

Functionality Testing

Functionality testing is done to check that the software operates correctly in accordance with design specifications.

Should check during testing functionality:

- Installation and configuration on the local machine
- Enter text, including using non-Latin characters or extended.
- The main functions of the applications that have not been tested during Smoke testing.
- Exact hotkey shortcuts without any duplication.



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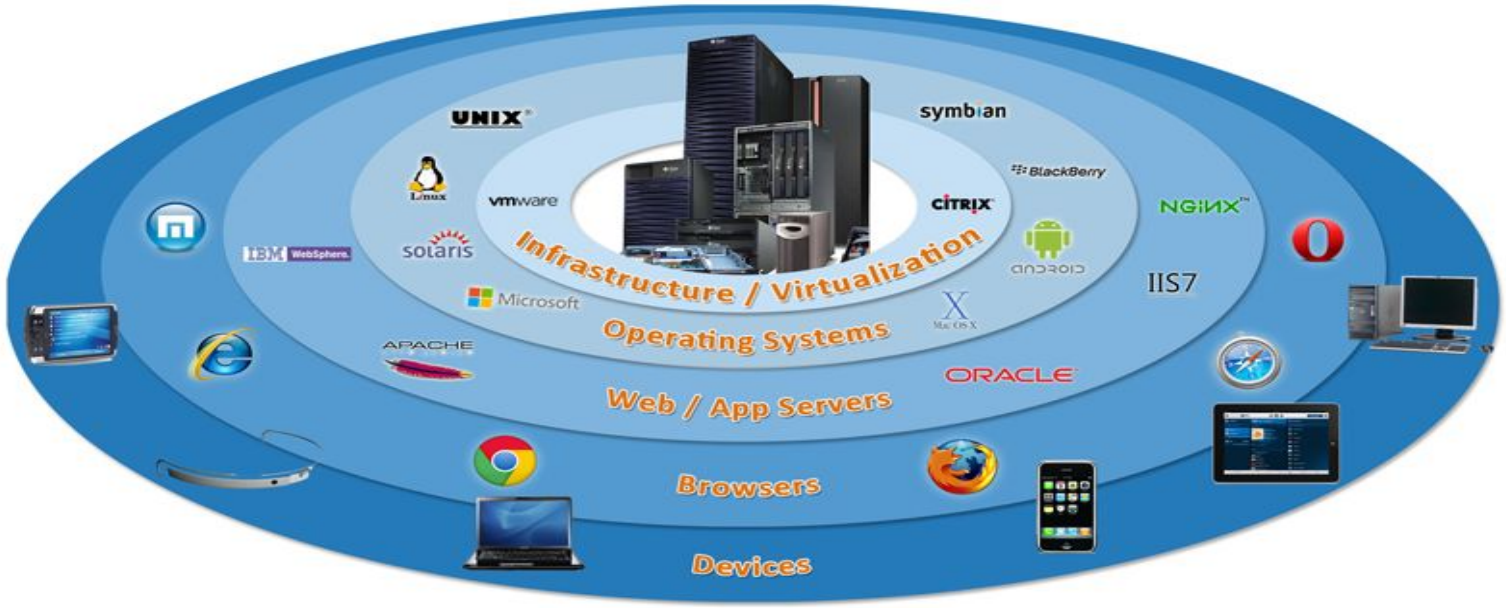
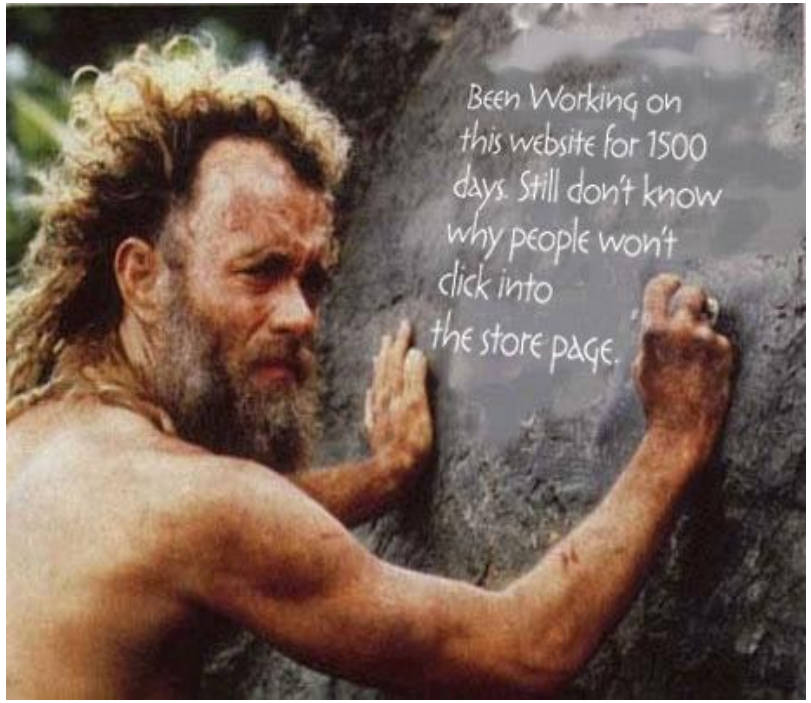
Compatibility testing



Checks whether the application or software compatible with the hardware, operating system, database or other software systems.

Usability testing

Usability testing - is the testing that is necessary to verify that the user interface is easy to use and understand.



Usability testing

Usability testing can be checked:

- Time on Task – How long it takes people to complete basic tasks? (For example, to find something to buy, create a new account and order detail).
- Accuracy – How many mistakes did people?
- Recall – How people can recall specific action steps after some time did not use the system?
- Emotional response – How people will feel themselves after finished task? (Are yon sure? Will users recommend this program to friends?)

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Security testing

Security testing - the process of determining what information system protects data and maintains functionality as intended.
Security testing, in general, this type of test that checks whether a program or product is protected or not.
This is a test whether the system is vulnerable to attack if anyone can break the system or enter without any permission.

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Localization testing

Localization (**L10N**) testing checks how well the application under test has been Localized into a particular target language.

Internationalization testing

Internationalization (**I18N**) testing checks if *all data/time/number/currency formats* are displayed according to selected locale and if all language specific characters are displayed.

Task:
Verify that list of users with German special characters (e.g.: “ü”, “ß” etc) in names are sorted correctly by ‘First Name’ column

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Testing types

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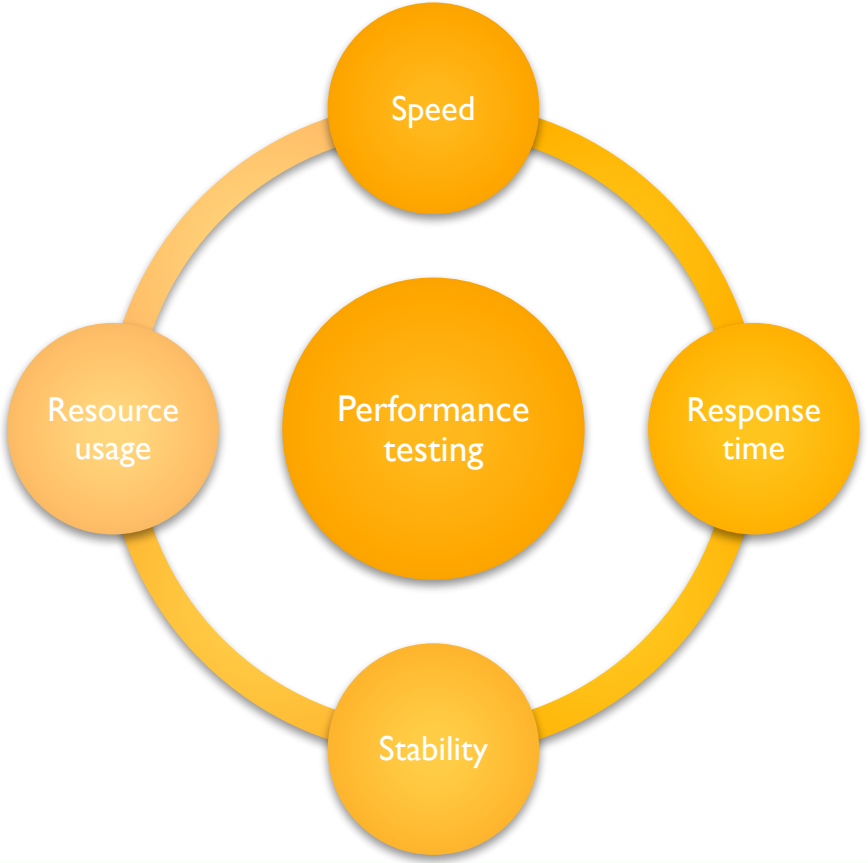
Performance Testing

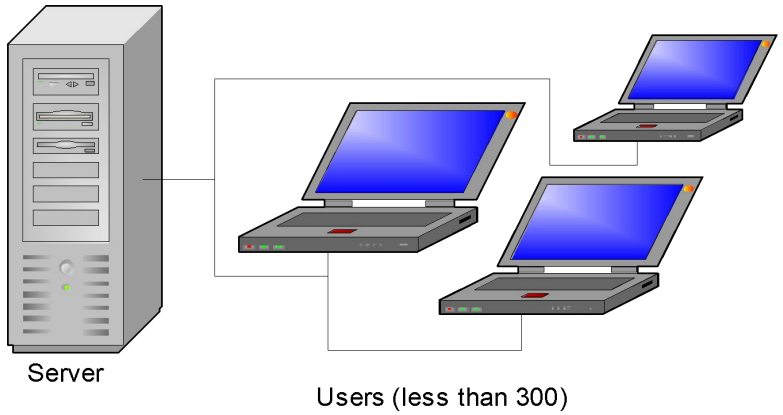
Testing with the intent of determining how efficiently a product handles a variety of events.



Criteria: Server should respond in less than 2 sec when up to 100 users access it concurrently. Server should respond in less than 5 sec when up to 300 users access it concurrently.

Performance Testing Procedure: emulate different amount of requests to server in range (0; 300), for instance, measure time for 1, 50, 100, 230 and 300 concurrent users.

Defect: starting from 200 concurrent requests respond time is 10-15 seconds.



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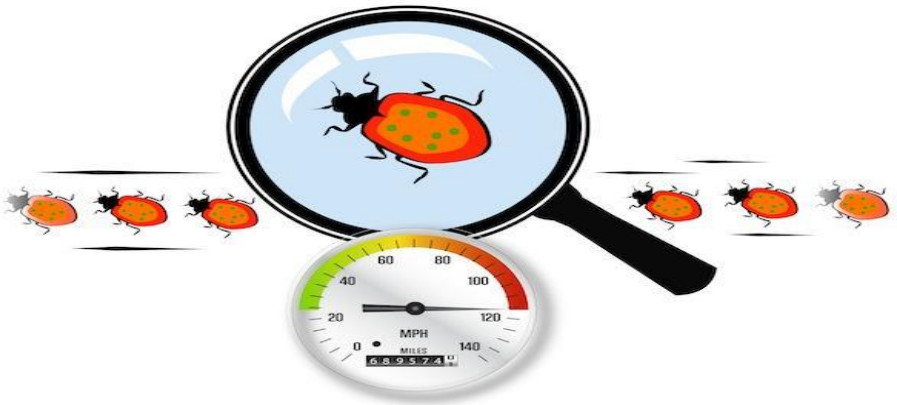
Load Testing

Load testing generally refers to the practice of modeling the expected usage of a software program by simulating multiple users accessing the program's services concurrently.

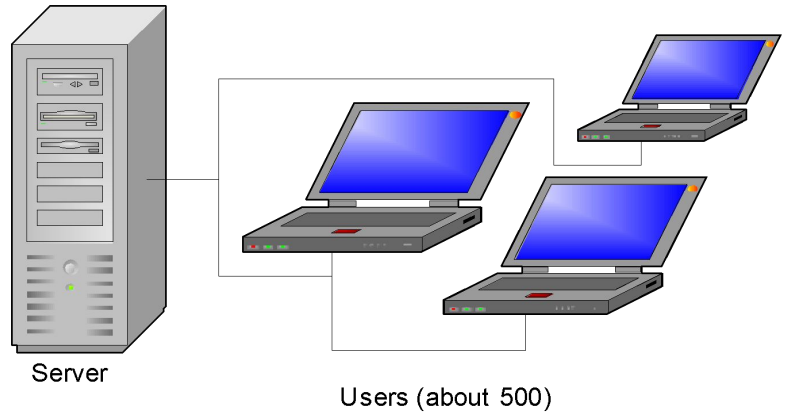
Load testing is subjecting a system to a statistically representative (usually) load. The two main reasons for using such loads is in support of software reliability testing and in performance testing.



Criteria: Server should allow up to 500 concurrent connections.

Load Testing Procedure: emulate different amount of requests to server close to pick value, for instance, measure time for 400, 450, 500 concurrent users.

Defect: Server returns “Request Time Out” starting from 480 concurrent requests.



Stress testing

Stress testing is a form of testing that is used to determine the stability of a given system or entity.

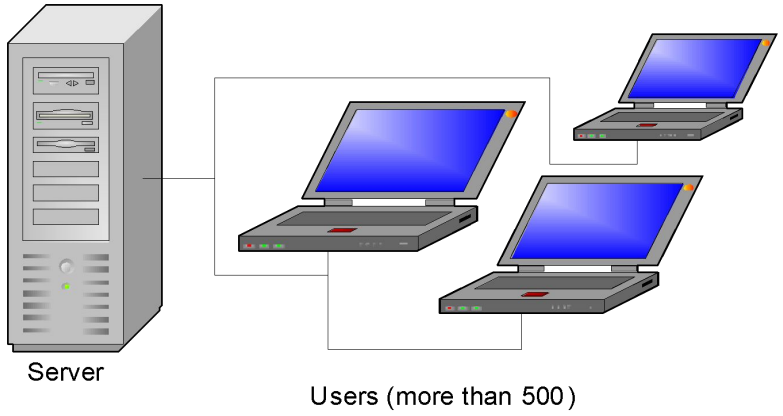
The idea is to stress a system to the breaking point in order to find bugs that will make that break potentially harmful.

Criteria: Server should allow up to 500 concurrent connections.

Stress Testing Procedure: emulate amount of requests to server greater than pick value, for instance, check system behavior for 510, and 550 concurrent users.

Defect: Server crashes starting from 500 concurrent requests and user's data is lost.

Data should not be lost even in stress situations. If possible, system crash also should be avoided.



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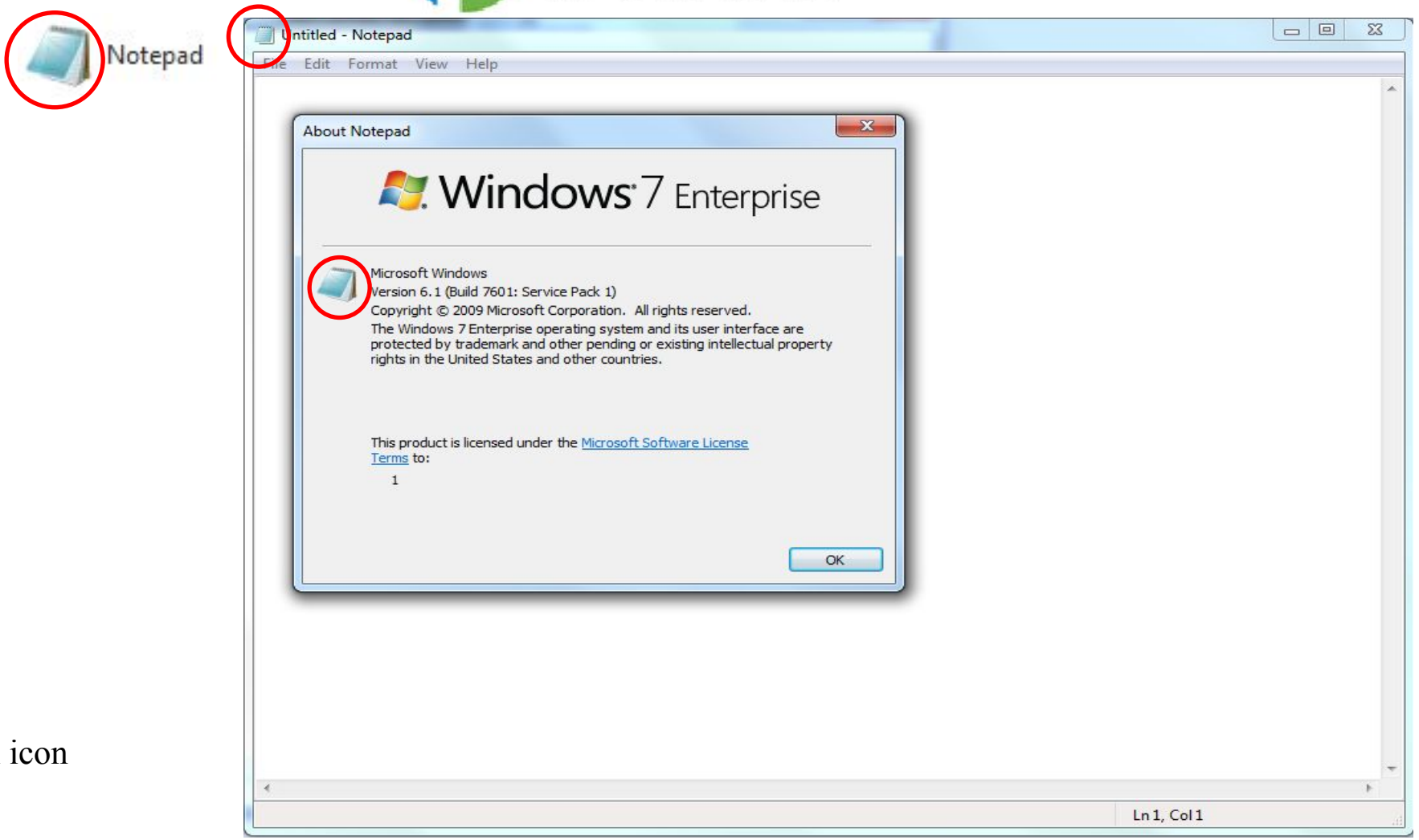
UI testing

User Interface testing is done to verify that the application interface to defined standards.

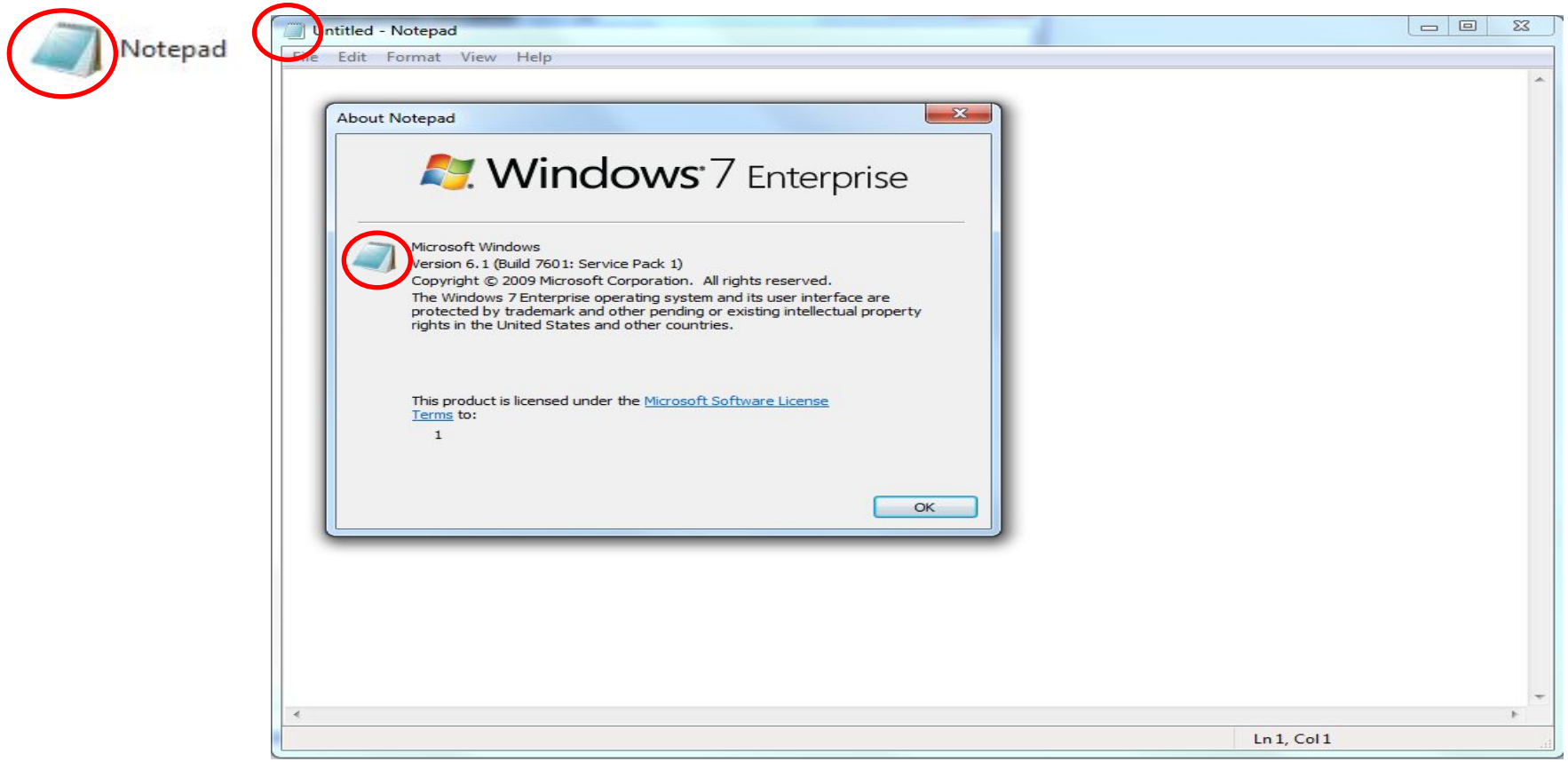
System icon



System icon = About box icon

System icon

System icon =
About box icon



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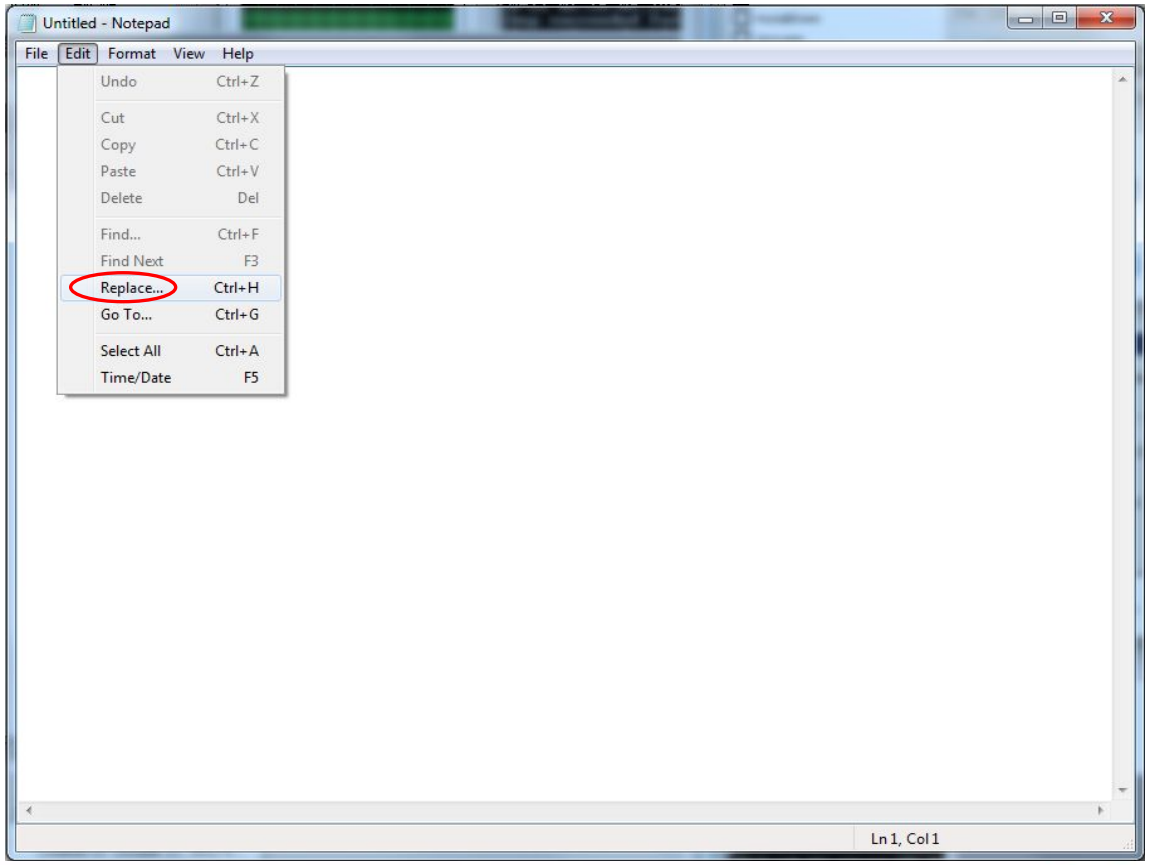
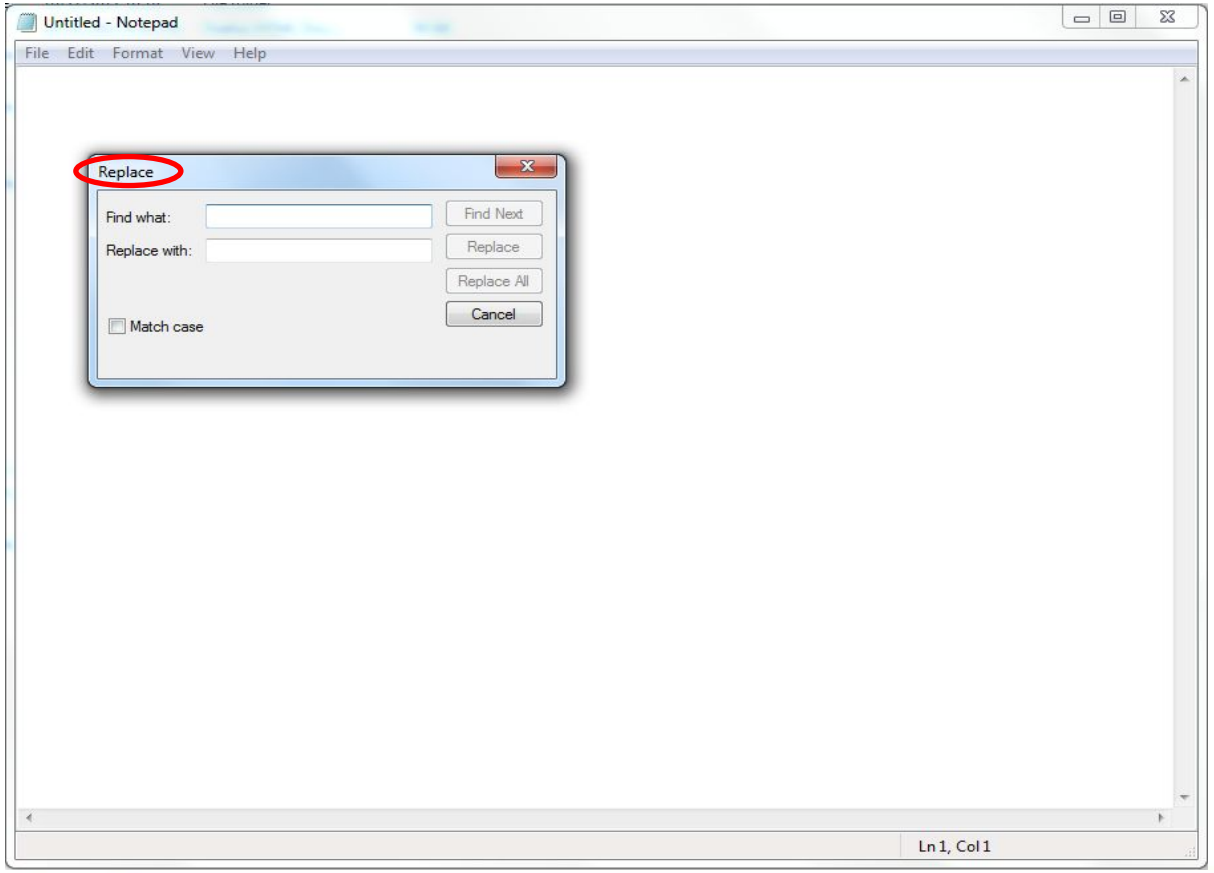
Dialog box title





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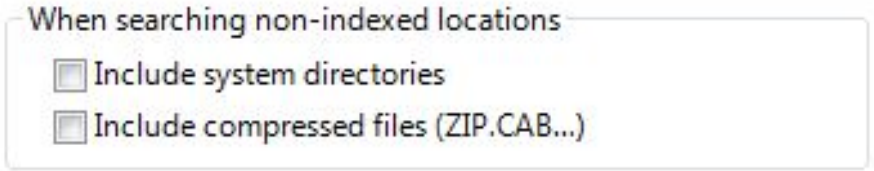
Incorrect:

Correct:

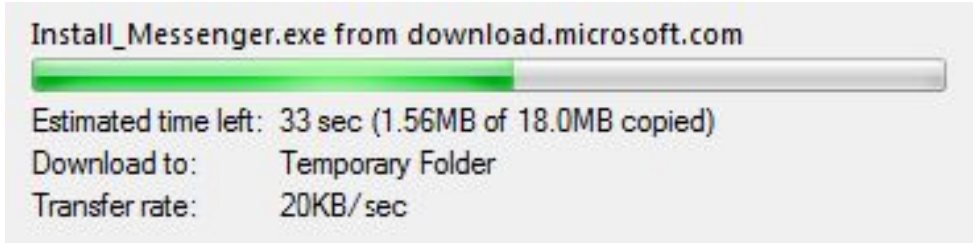
Incorrect:

Correct:



Progress bar details

Correct:



Incorrect:

Incorrect:

Correct:

Navigation links

Incorrect:
http://www.microsft.com
www.microsoft.com

Correct:
microsoft.com

Links and Text

Incorrect:

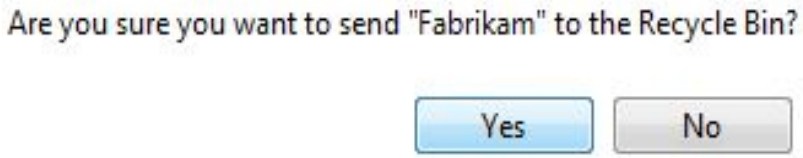
Go to a newsgroup.

Correct:

Go to a newsgroup.

Command buttons

Correct:



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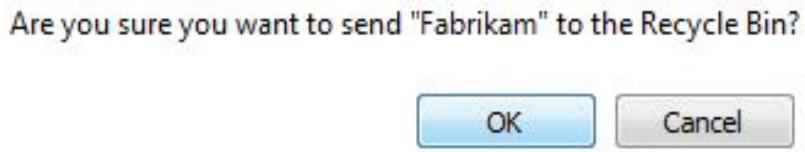
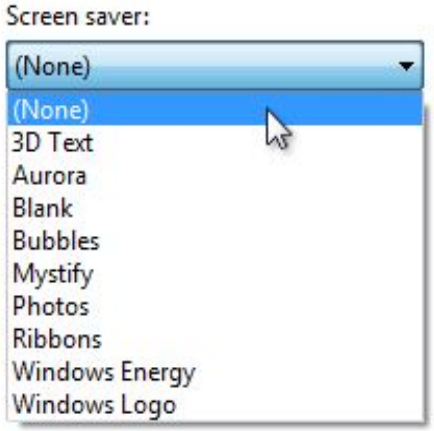
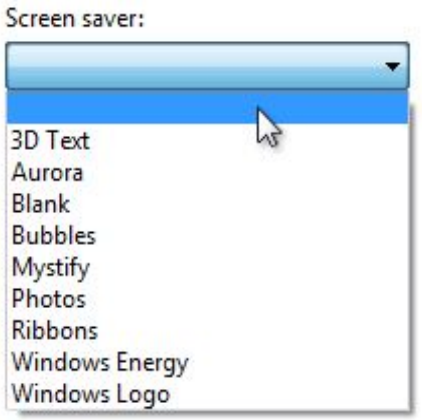


Drop-Down Lists

Correct:



Incorrect:



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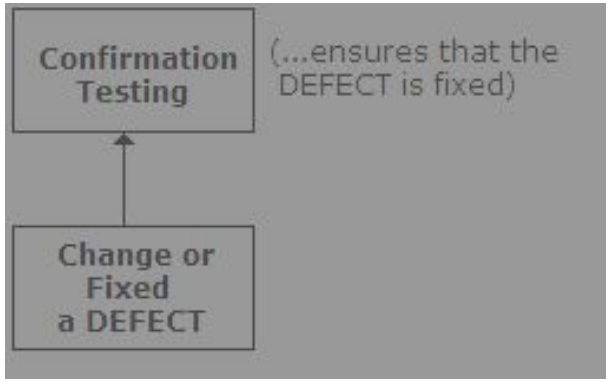
Regression, Re-testing

Confirmation testing (re-testing)

Confirmation testing - retesting, which confirms that the bug has been sent. There are words synonymous with re-testing.



It is important to ensure that the test is executed in exactly the same way it was the first time using the same inputs, data and environments.

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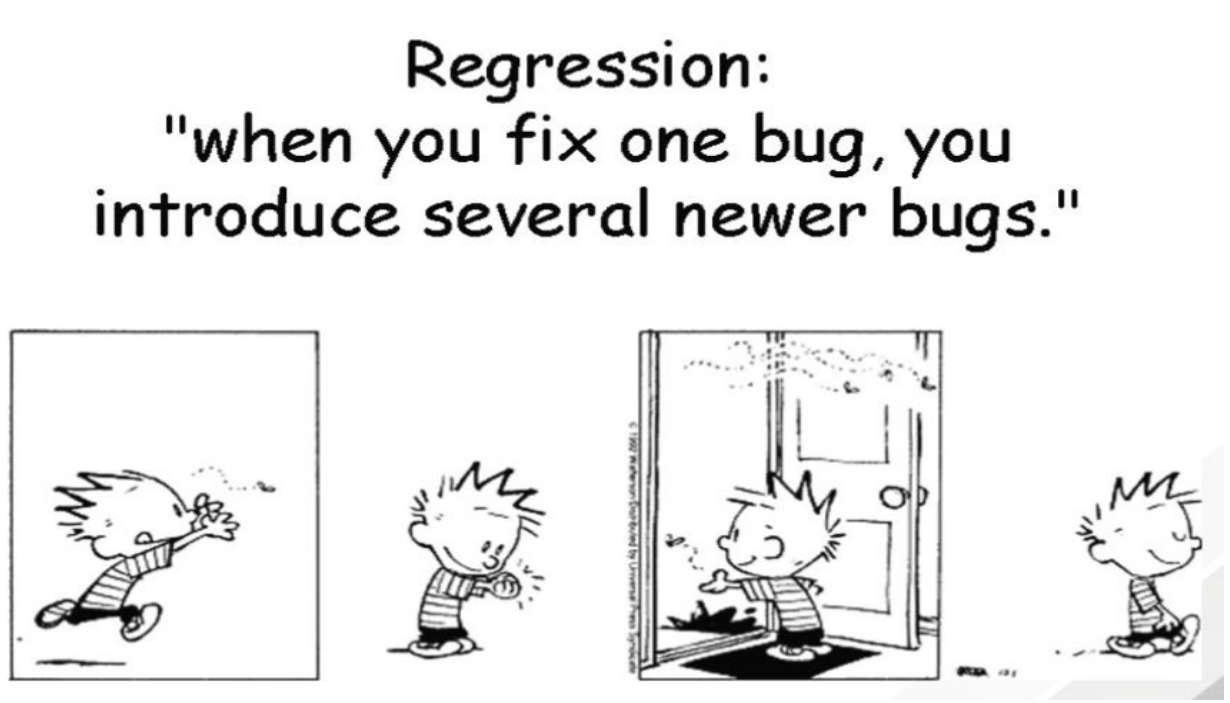
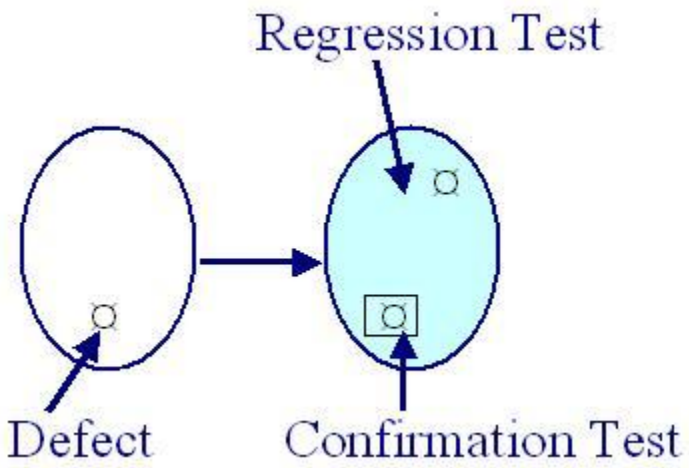
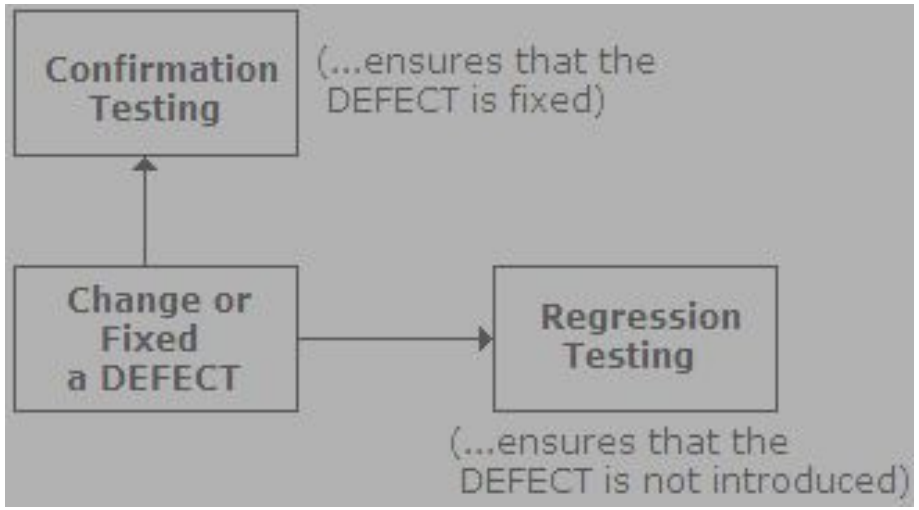
Regression testing

Regression testing is to verify that the changes made in the software (if corrected old bugs) have not led to the emergence of new bugs.

Such errors - when you make changes to the program stops working that would work - called regressive errors.




Regression Test
Defect
Confirmation Test


Confirmation Testing
(...ensures that the DEFECT is fixed)
Change or Fixed a DEFECT
Regression Testing
(...ensures that the DEFECT is not introduced)

Solving regression testing

a. Prioritizing the test suit and the test cases.
b. Optimization of the test kits.
c. Hiring of new testers.
d Automation regression testing.

Regression Testing Tools

Example regression testing tools are:

- ✔ Win runner
- ✔ QTP
- ✔ AdventNet QEngine
- ✔ Regression Tester
- ✔ vTest
- ✔ Watir
- ✔ Selenium
- ✔ actiWate
- ✔ Rational Functional Tester
- ✔ SilkTest

- Proactive and Reactive
- Manual and Automated
- Verification and Validation
- Box-techniques
- Positive and Negative
- Scripted and Unscripted

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Proactive testing

- Proactive behavior involves acting in advance of a future situation, rather than just reacting.
- Test design process is initiated as early as possible in order to find and fix the defects before the build is created

Reactive testing

- Reactive behavior is reacting to problems when they occur instead of doing something to prevent them
- Testing is not started until design and coding are completed

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Manual and Automated

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Manual

- **Manual testing** is the process through which software developers run tests manually, comparing program expectations and actual outcomes in order to find software defects

Automated

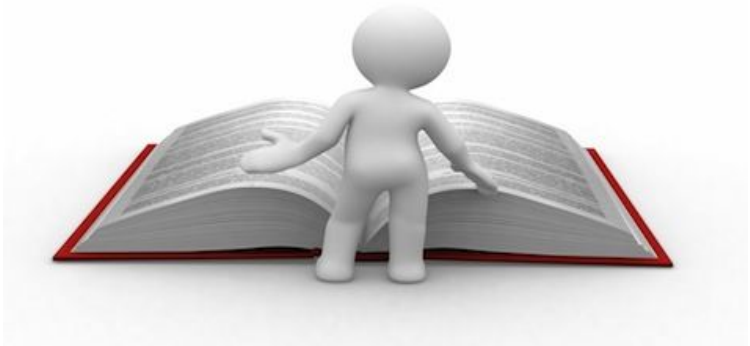
- **Automated testing** is the process through which automated tools run tests that repeat predefined actions, comparing a developing program's expected and actual outcomes

Manual Testing	Automated Testing
Time consuming and tedious: Since test cases are executed by human resources so it is very slow and tedious.	Fast: Automation runs test cases significantly faster than human resources.
Less reliable: Manual testing is less reliable as tests may not be performed with precision each time because of human errors.	More reliable: Automation tests perform precisely same operation each time they are run.
Self-contained: Manual testing can be performed and completed manually and provide self-contained results.	Not self-contained: Automation can't be done without manual testing. And you have to manually check the automated test results.
Implicit: Implicit knowledge are used to judge whether or not something is working as expected. This enables engineer to find extra bugs that automated tests would never find.	Explicit: Automated tests execute consistently as they don't get tired and/or lazy like us humans.

Verification and Validation

Are we building
the product **right**?

To ensure that work products meet their specified requirements.



Are we building
the **right** product?

To ensure that the product actually meets the user's needs, and that the specifications were correct in the first place.

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Examples

Designer designs a new car according the requirements of his client. After producing the prototype he ***verifies*** that the prototype is according to the requirements.

The next step before going to the mass production is to check in "real conditions" if the prototype does that what the client thought it would do (***validation***).

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Black-box, White-box, Grey-box

Black-box Testing is a software testing method in which the internal structure/ design/ implementation of the item being tested is NOT known to the tester.

White-box Testing is a software testing method in which the internal structure/ design/ implementation of the item being tested is known to the tester.

Black-box Testing	White-box Testing
Levels Applicable To: System, Acceptance Test Levels	**Levels Applicable To**: Component, Integration Test Level
Responsibility: Quality Control Engineers	**Responsibility:** Software Developers

Grey-box Testing is a software testing method which is a combination of Black-box and White-box Testing methods.

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Positive and Negative

Positive testing

to prove that an application will work on giving valid input data. i.e. testing a system by giving its corresponding valid inputs or actions.

Negative testing

to prove that an application will give correct behavior on giving invalid inputs or actions.

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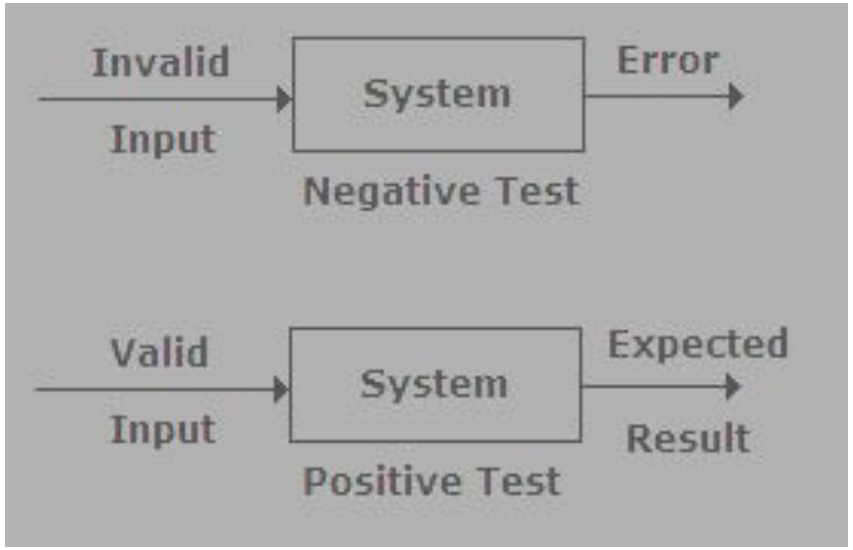
Examples

Positive Testing

Age: 999

Enter only Numbers



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Scripted and Unscripted

Scripted testing

Test execution carried out by following a previously documented sequence of tests.

Unscripted testing

Test execution carried out without previously documented sequence of tests.

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Exploratory testing

An informal test design technique where the tester actively controls the design of the tests as those tests are performed and uses information gained while testing to design new and better tests

Unscripted testing

Ad-hoc testing

Testing carried out informally; no formal test preparation takes place, no recognized test design technique is used, there are no expectations for results and
arbitrariness guides the test execution activity

Exploratory Testing	Ad-hoc Testing
Aim: to get the information to design new and better tests	Aim: to find defects
Result: defects are found and registered; new tests are designed and documented for further usage	Result: defects are found and registered

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