

Content:- Introduction to software testing and Validation & Introduction to various Testing Tools.

Software Testing :- It is a method to check whether the actual software product matches expected requirements and to ensure that software product is defect free.

It involves execution of software / system components using manual or automated tools to evaluate one or more properties of interest.

The purpose of software testing is to identify errors, gaps or missing requirements in contrast to actual requirements.

Software Validation and Verification :-

① Verification :- It is the process of checking that a software achieves its goal without any bugs. It is the process to ensure whether the product that is developed is right or not. It verifies whether the developed product fulfills the requirements that we have.

It is static testing.

It includes inspection, reviews, walkthroughs and desk checking.

② Validation :- It is the process of checking whether the software product is up to the mark or product has high level requirements. It is the process of checking the validation of product i.e., it checks what we are developing is the right product. It is validation of actual and expected product.

It is Dynamic Testing.

It includes, white box, black box, unit and integration testing.

Advantages :-

① Cost Effective :- Testing any IT project on time helps you to save your money for the long term.

② Security :- People are looking for trusted products.
It helps in removing risks and problems earlier.

③ Product Quality :- Testing ensures a quality product is delivered to customers.

④ Customer Satisfaction :- UI/UX Testing ensures the best user experience.

Types of Software Testing :- It includes functional, non-functional and Maintenance Testing.

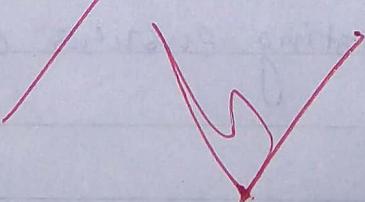
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Performance Testing :- Testing how the software performs under different workloads - load test, for example, is used to evaluate performance under real-life load conditions.

Regression Testing :- Checking whether new features break or degrade functionality. Sanity testing can be used to verify menus, functions and commands at the surface level when there is no time for a full regression test.

Stress testing :- Testing how much strain the system can take before it fails. Considered to be a type of non-functional testing.

Usability Testing :- Validating how well a customer can use a system or web application to complete a task.



Functional testing includes unit, integration, smoke, UAT (User Acceptance Testing), localization, globalization, interoperability and so on.

Non Functional Testing includes performance, endurance, load, volume, scalability, Usability etc types of testing.

Maintenance Testing includes regression and maintenance testing.

White Box Testing :- It is a software testing method in which the internal structure/design/implementation of the item being tested is known to the tester. Implementation and impact of the code are tested.

Black Box Testing :- It is a testing method in which the internal structure/design/implementation of the item being tested is not known to the tester. Only the external design and structure are tested.

Unit Testing :- It is the basic approach is followed by the programmer to test the unit of the program. It helps developers to know whether the individual unit of the code is working properly or not.

Integration Testing :- It focuses on the construction and design of the software. You need to see the integrated units are working without errors or not.

System Testing :- Here, the software is compiled as a whole and then tested as a whole. It checks the functionality, security, portability, amongst others.

Software Testing Tools :-

- ① Apache JMeter :- It is open source application software, a 100% pure Java application designed to load test functional behaviors and measure performance. It was originally designed for testing web applications but has since expanded to other test functions.
- ② Tira :- It is an issue tracking & project management tools for teams. It helps teams across financial services, retail, software, high tech, automotive, non-profit, government etc.
- ③ Selenium :- It is testing framework to perform web application testing across various browsers and platforms like windows, Mac & Linux.

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Objective: - Introduction to performance Testing using software Apache JMeter.

It is the testing method performed using Apache JMeter to test the performance of a web application.

It helps to test both static & dynamic resources, helps to discover concurrent users on website and provides variety of graphical analysis for performance testing. It includes load test and stress test of web application.

Steps to install JMeter

- ① Install Java. Because JMeter is pure Java desktop application.
- ② Download JMeter, latest version of JMeter is Apache JMeter 4.2
- ③ Install by unzipping the zip/tar file into the directory
set the environment variable for both Apache JMeter and Java.
- ④ Launch JMeter → we can start JMeter in 3 modes
GUI mode, server mode or command line mode.

Create First JMeter Test

bif①

Start Jmeter

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- Step 2 Create a TestPlan - by Select Test Plan on the tree.
- Step 3 Add Thread Group
- In the thread group control panel
- Number of Threads :- 100 (No. of users connects to the target website : 100)
- Loop Count 10 (No. of times to execute testing)
- Ramp - Up Period :- 100
- Step 4 Adding Jmeter Sampler - Right click on Thread Group & select Add → Samplers → HTTP Request
- In the HTTP Request Defaults control panel, enter the website name under test (<http://www.google.com>).
- Step 5 Adding Graph Result :- It can show test result in Graph format.
- Right click Test Plan, Add → Listener → Graph Result
- Step 6 Run Test and get the test Result :-
- Press the Run button (ctrl + R) on the Toolbar to start the software testing process. You will see the test events display on Graph in the real time.

Experiment -3

Objectives

- Performance Testing using Software Apache JMeter for the web site Amazon.com & Flipkart.com for shopping and compare the result

Tools and Technology :- JMETER Tool and Performance Testing Amazon.

Procedure :-

(1) Start JMeter.

(2) Create a Test Plan by select Test Plan on the tree.

No. of threads (users) :- 100

Ramp up period (seconds) :- 10

Loop Count :- 10.

(3) Adding JMeter Samplers :- Select HTTP Request.

In the HTTP Request Path add the link of the website.

Path : www.amazon.com.

(4) Adding Graph Result :- It can show test result in graph format.

Rightclick Test Plan → Add → Listener → Graph Results

(5) Save the file.

(6) Add Summary Report :- Add file name or file location where it is saved.

Press Run Button. Report is generated.

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Flipkart :-

- ① Start Jmeter
- ② Create a Test Plan by ~~opening~~ select Test Plan on the tree.
- ③ Add Thread Group.

No. of threads :- 100

Ramp-up period :- 10

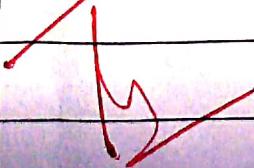
Loop count :- 10

- ④ Adding Jmeter Sampler - Select HTTP Request
In the HTTP Request Path add the link of the website
Path : www.flipkart.com

Adding Graph Result :-

Right click Test Plan → Add → Listener → Graph Results

- ⑥ Save the file -
- ⑦ Add Summary Report :- Add filename or file location where it is saved
Press Run Button, Report is Generated.



Objectivit: Performance Testing using software Apache Jmeter for the website for Railway Reservation irctc.co.in & Erai.in Ticket Booking site and compare the result.

For IRCTC

Procedure :-

(1) Start Jmeter.

(2) Create a Test Plan by Select Test Plan on the tree.

(3) Add Thread Group

No. of threads :- 100

Ramp up period :- 10

Loop Count :- 10.

(4) Adding Jmeter Samplers :- select HTTP Request.

In the HTTP Request Path add the link of the website.

Path: www.irctc.co.in

(5) Adding Graph Result :- It can show the result in Graph format

Rightclick Test plan → Add → Listener → Graph Results.

(6) Save file.

(7) Add summary Report :- Add filename or file location where it is saved.

Press Run Button :- Report is generated.

For Erail.in

- ① Start Jmeter.
- ② Create a Test Plan.
- ③ Add Thread Group.

No. of threads :- 100

Ramp up period : 10

Loop Count : 10

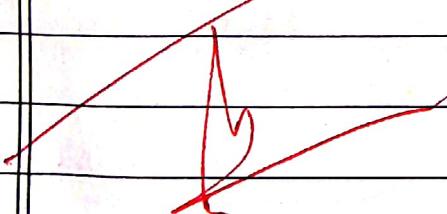
- ④ Adding Jmeter sampler :- Select HTTP Request . In the HTTP Request Path add the link of the website.
Path: www.Erail.in

- ⑤ Adding Graph Result

- ⑥ Save file.

- ⑦ Add Summary Report & Add filename or file location where it is saved.

Press Run Button :- Report is generated.



Objectives :- Performance Testing using software Apache JMeter for the website for Social Networking Facebook.com & Instagram.com for social Networking and compare the results.

Procedures :- For Facebook.com

- ① Start JMeter.
- ② Create a Test Plan by select Test Plan on the tree.
- ③ Add Thread Group

No. Of Threads :- 100

Ramp up period :- 10

Loop Count :- 10

- ④ Adding Jmeter Samplers :- Select HTTP Request
In the HTTP Request Path add the link of the website.

Path :- www.facebook.com

- ⑤ Add graph Results.

- ⑥ Save the file.

- ⑦ Add summary Report :- Add filename or file location where it is saved.

Press Run button :- Report is Generated.

For Instagram.com

- ① open Jmeter.
- ② Create TestPlan
- ③ Adding Thread Group :-

No. of threads :- 100

Ramp up Period :- 10

Loop Count 1-10

- ④ Adding Jmeter Sampler :- select HTTP Request . In the HTTP Request Path add the link of the website
Path:- www.instagram.com.

- ⑤ Adding Graph Result.

- ⑥ Save file.

- ⑦ Add Summary Report :- Add filename or file location where it is saved.

Press Run Button :- report is generated.

