AUTOMATION TESTING

BASICS OF SQL

What is SQL?

- “Structure Query Language”.
- For any operations on the database we need one standard language and SQL serves the purpose for that.
- In general, SQL is a language for communicating with the database server to access.
- According to ANSI (American National Standards Institute), it is the standard language for relational database management systems eg: Oracle,Sybase,MS SQL Server, Access etc.
- SQL statements are used to perform tasks such as update data on a database, or retrieve data from a database.

Basic Operations

- SELECT - extracts data from a database
- UPDATE - updates data in a database
- DELETE - deletes data from a database
- INSERT - inserts new data into a database

* SQL is not case sensitive

Using the Comparison Operators

Basics of JAVA

What is JAVA?

Java is a programming language and a platform. Java is a high level, robust, object-oriented and secure programming language.

Java was developed by *Sun Microsystems* (which is now the subsidiary of Oracle) in the year 1995. *James Gosling* is known as the father of Java.

Types of Java Applications

There are mainly 4 types of applications that can be created using Java programming:

1) Standalone Application

Standalone applications are also known as desktop applications or window-based applications. These are traditional software that we need to install on every machine. Examples of standalone applications are Media player, antivirus, etc. AWT and Swing are used in Java for creating standalone applications.

2) Web Application

An application that runs on the server side and creates a dynamic page is called a web application. Currently, Servlet, JSP, Struts, Spring, Hibernate, JSF, etc. technologies are used for creating web applications in Java.

3) Enterprise Application

An application that is distributed in nature, such as banking applications, etc. is called enterprise application. It has advantages of high-level security, load balancing, and clustering. In Java, EJB is used for creating enterprise applications.

4) Mobile Application

An application which is created for mobile devices is called a mobile application. Currently, Android and Java ME are used for creating mobile applications.

Features of Java

1. Simple
2. Object-Oriented
3. Portable
4. Platform independent
5. Secured
6. Robust
7. Architecture neutral
8. Interpreted
9. High Performance
10. Multithreaded
11. Distributed
12. Dynamic

Object-oriented

Java is an object-oriented programming language. Everything in Java is an object. Object-oriented means we organize our software as a combination of different types of objects that incorporate both data and behavior.

Object-oriented programming (OOPs) is a methodology that simplifies software development and maintenance by providing some rules.

Basic concepts of OOPs are:

1. Object
2. Class
3. Inheritance
4. Polymorphism

5. **Abstraction**
6. **Encapsulation**

Object

Any entity that has state and behaviour is known as an object. For example, a chair, pen, table, keyboard, bike, etc. It can be physical or logical.

An Object can be defined as an instance of a class. An object contains an address and takes up some space in memory. Objects can communicate without knowing the details of each other's data or code. The only necessary thing is the type of message accepted and the type of response returned by the objects.

Class

Collection of objects is called class. It is a logical entity.

A class can also be defined as a blueprint from which you can create an individual object. Class doesn't consume any space.

Inheritance

***When one object acquires all the properties and behaviors of a parent object*, it is known as inheritance. It provides code reusability. It is used to achieve runtime polymorphism.**

Polymorphism

If *one task is performed in different ways*, it is known as polymorphism. For example: to convince the customer differently, to draw something, for example, shape, triangle, rectangle, etc.

In Java, we use method overloading and method overriding to achieve polymorphism.

Another example can be to speak something; for example, a cat speaks meow, dog barks woof, etc.

Abstraction

***Hiding internal details and showing functionality* is known as abstraction. For example phone calls, we don't know the internal processing.**

Encapsulation

***Binding (or wrapping) code and data together into a single unit are known as encapsulation*. For example, a capsule, it is wrapped with different medicines.**

Java Control Statements

Java compiler executes the code from top to bottom. The statements in the code are executed according to the order in which they appear. However, Java provides statements that can be used to control the flow of Java code. Such statements are called control flow statements. It is one of the fundamental features of Java, which provides a smooth flow of program.

Java provides three types of control flow statements.

1. **Decision Making statement**
2.
    - **switch statement**
3. **Loop statements**
    - **do while loop**
    - **while loop**
    - **for loop**
    - **for-each loop**
4. **Jump statements**
    - **break statement**
    - **continue statement**

1) If Statement:

1. **Simple if statement**
2. **if-else statement**
3. **if-else-if ladder**
4. **Nested if-statement**

Syntax of if statement is given below.

```
if(condition) {

statement 1; //executes when condition is true

}
```

Example:Student.java

```
public class Student {
public static void main(String[] args) {
int x = 10;
int y = 12;
if(x+y > 20) {
System.out.println("x + y is greater than 20");
}
}
}
```

2) if-else statement

```
if(condition) {
statement 1; //executes when condition is true
}
else{
statement 2; //executes when condition is false
}
```

Example:

```
public class Student {
public static void main(String[] args) {
int x = 10;
int y = 12;
if(x+y < 10) {
System.out.println("x + y is less than      10");
}   else {
```

```
System.out.println("x + y is greater than 20");
}
}
}
```

3) if-else-if ladder:

```
if(condition 1) {
statement 1; //executes when condition 1 is true
}
else if(condition 2) {
statement 2; //executes when condition 2 is true
}
else {
statement 3; //executes when all the conditions are false
}
```

Example:

```
public class Student {
public static void main(String[] args) {
String city = "Delhi";
if(city == "Meerut") {
System.out.println("city is meerut");
}else if (city == "Noida") {
System.out.println("city is noida");
}else if(city == "Agra") {
System.out.println("city is agra");
}else {
System.out.println(city);
}
}
}
```

4. Nested if-statement

```
if(condition 1) {
statement 1; //executes when condition 1 is true
if(condition 2) {
statement 2; //executes when condition 2 is true
}
else{
statement 2; //executes when condition 2 is false
}
}
```

Switch Statement:

```
switch (expression){
   case value1:
    statement1;
    break;
   .
   .
   .
   case valueN:
    statementN;
    break;
   default:
     default statement;
}
```

Example:

SwitchExample.java

```
public class SwitchExample {
public static void main(String[] args) {
    //Declaring a variable for switch expression
    int number=20;
    //Switch expression
    switch(number){
    //Case statements
    case 10: System.out.println("10");
    break;
    case 20: System.out.println("20");
    break;
    case 30: System.out.println("30");
    break;
    //Default case statement
    default:System.out.println("Not in 10, 20 or 30");
    }
}
}
```

Loops in Java

The Java *for loop* is used to iterate a part of the program several times. If the number of iterations is fixed, it is recommended to use a for loop.

For Loop

```
for(initialization; condition; increment/decrement){
//ment or cstateode to be executed
}
```

Example:

ForExample.java

```
//Java Program to demonstrate the example of for loop
//which prints table of 1
public class ForExample {
public static void main(String[] args) {
   //Code of Java for loop
   for(int i=1;i<=10;i++){
       System.out.println(i);
   }
}
}
```

While Loop

```
while (condition){
//code to be executed
Increment / decrement statement
}
```

WhileExample.java

```
public class WhileExample {
public static void main(String[] args) {
   int i=1;
   while(i<=10){
      System.out.println(i);
   i++;
   }
}
}
```

do-while Loop

```
do{
//code to be executed / loop body
//update statement
}while (condition);
```

DoWhileExample.java

```
public class DoWhileExample {
```

```
public static void main(String[] args) {

   int i=1;

   do{

      System.out.println(i);

   i++;

   }while(i<=10);

}

}
```

SAmple programs without conditions/loop

1.add two number

2.subtract

3.multiplication

4.division

5.Area of rectangle

6.area of triangle

7.perimeter of rectangle

8.area of circle

Sample programs using conditions/loops

1.factorial

2.fibonacci

3.palindrome

4.given year is leap year or not

5.odd or even

6.prime or not

7.calculator using switch

8.Armstrong or not

9.Largest among 2 numbers

10.Largest among 3 numbers

11.Reverse a number

12.print following patterns:

```
*
**
***
****
*****
```

```
*****
 ****
  ***
   **
    *
```

```
1
12
123
1234
12345
```

```
1
23
456
78910
```

```
    *
    **
   * * *
  * * * *
 * * * * *
```

```
     *
    **
   ***
  ****
 *****
```

Bugzilla

What is Bugzilla?

Bugzilla is an open-source issue/bug tracking system that allows developers to keep track of outstanding problems with their product. It is written in Perl and uses a MYSQL database.

Bugzilla is a Defect tracking tool, however, it can be used as a test management tool as such it can be easily linked with other Test Case management tools like Quality Center, Testlink etc.

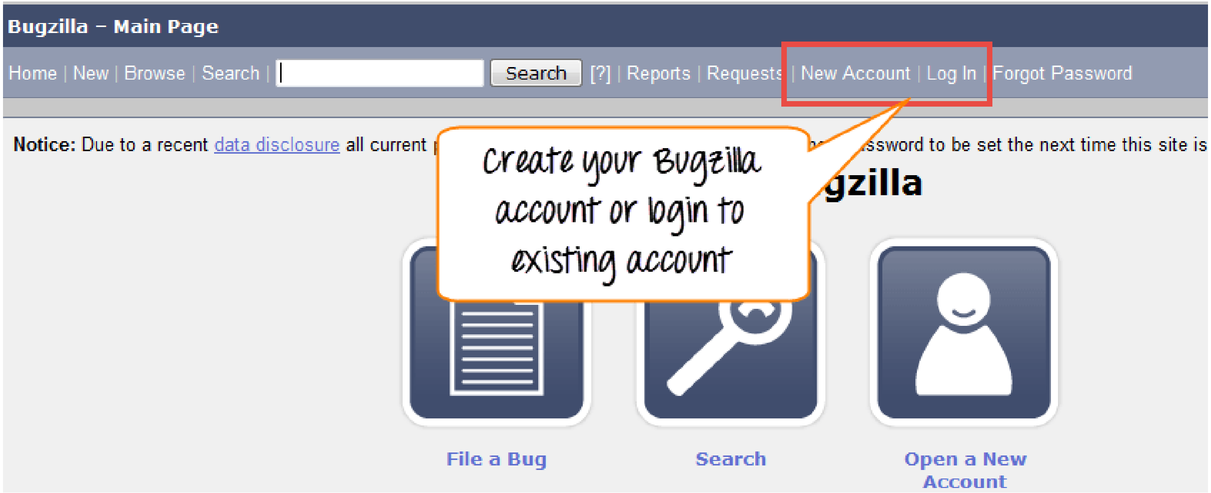
This open bug-tracker enables users to stay connected with their clients or employees, to communicate about problems effectively throughout the data-management chain.

Key features of Bugzilla includes

- Advanced search capabilities
- E-mail Notifications
- Modify/file Bugs by email
- Time tracking
- Strong security
- Customization
- Localization

How to log-in to Bugzilla

Step 1) Use the following link for your handons. To create an account in Bugzilla tool or to login into the existing account go to New Account or Log in option in the main menu.

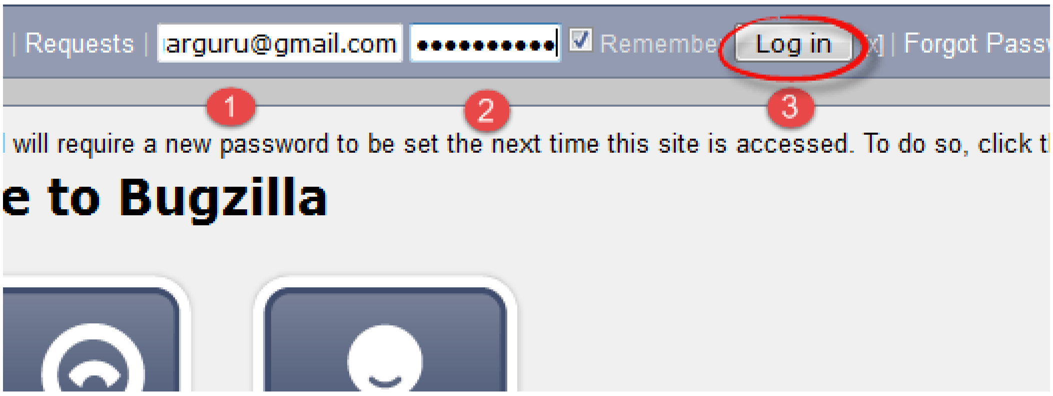

Bugzilla – Main Page
Home | New | Browse | Search | Search [?] | Reports | Requests | New Account | Log In | Forgot Password
gzilla
File a Bug
Search
Open a New Account

Notice: Due to a recent data disclosure all current ... ssword to be set the next time this site is

Create your Bugzilla account or login to existing account

Step 2) Now, enter your personal details to log into Bugzilla

1. User ID
2. Password
3. And then click on "Log in"

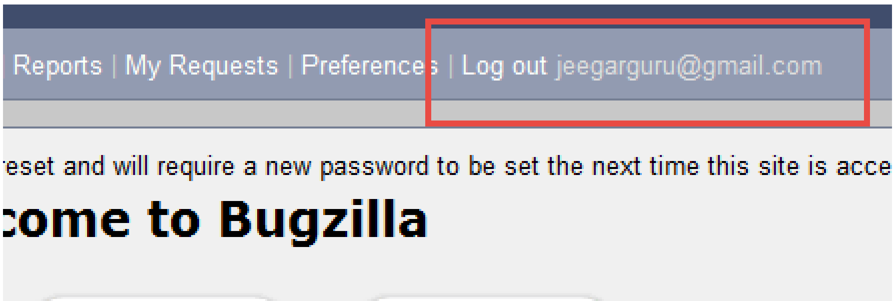


arguru@gmail.com

•••••••••••

will require a new password to be set the next time this site is accessed. To do so, click t

Step 3) You are successfully logged into Bugzilla system

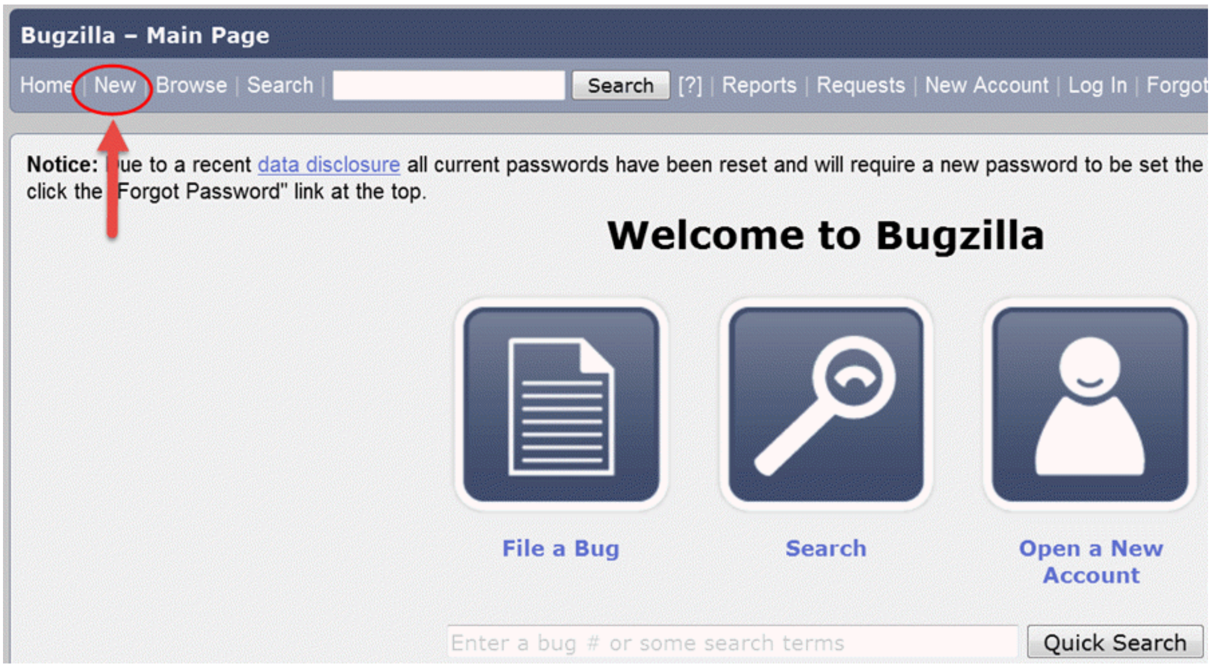

Reports | My Requests | Preferences | Log out jeegarguru@gmail.com

eset and will require a new password to be set the next time this site is acce

come to Bugzilla

Creating a Bug-report in Bugzilla

Step 1) To create a new bug in Bugzilla, visit the home-page of Bugzilla and click on NEW tab from the main menu


Bugzilla – Main Page
Home | New | Browse | Search | Search [?] | Reports | Requests | New Account | Log In | Forgot
File a Bug
Search
Open a New Account
Enter a bug # or some search terms
Quick Search

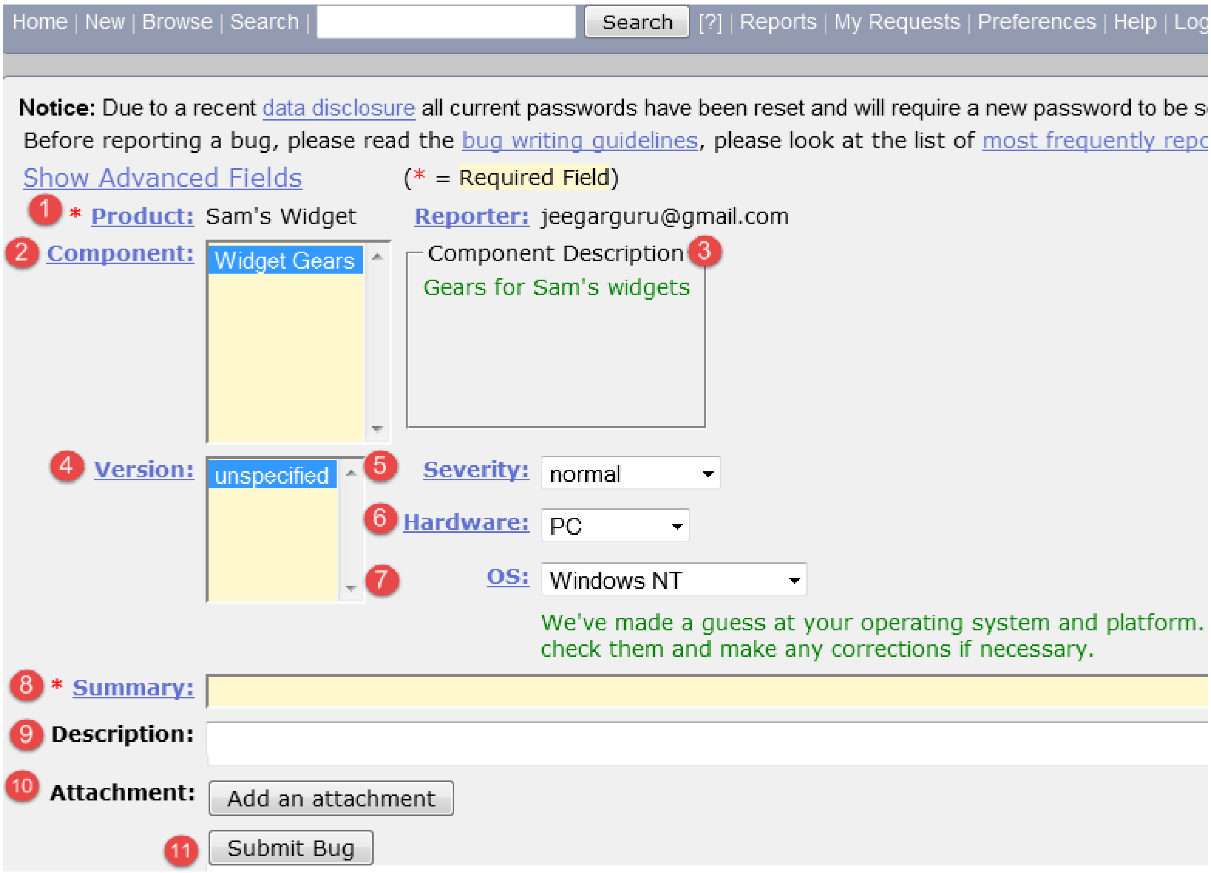
Notice: Due to a recent data disclosure all current passwords have been reset and will require a new password to be set the click the "Forgot Password" link at the top.

Welcome to Bugzilla

Step 2) In the next window

1. Enter Product
2. Enter Component
3. Give Component description
4. Select version,
5. Select severity

6. Select Hardware
7. Select OS
8. Enter Summary
9. Enter Description
10. Attach Attachment
11. Submit


Home | New | Browse | Search | Search [?] | Reports | My Requests | Preferences | Help | Log
Show Advanced Fields
Add an attachment
Submit Bug
1
2
3
4
5
6
7
8
9
10
11

Notice: Due to a recent data disclosure all current passwords have been reset and will require a new password to be s

Before reporting a bug, please read the bug writing guidelines, please look at the list of most frequently repo

(* = Required Field)

1 * **Product:** Sam's Widget **Reporter:** jeegarguru@gmail.com

2 **Component:** Widget Gears

Component Description 3
Gears for Sam's widgets

4 **Version:** unspecified

5 **Severity:** normal

6 **Hardware:** PC

7 **OS:** Windows NT

We've made a guess at your operating system and platform. check them and make any corrections if necessary.

8 * **Summary:**

9 **Description:**

10 **Attachment:**

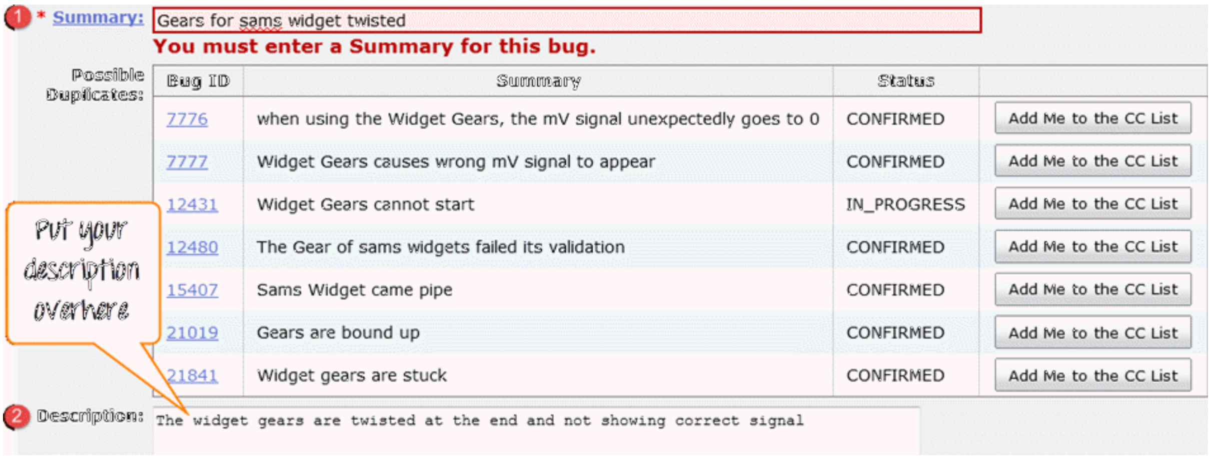
NOTE: The mandatory fields are marked with *.

In our case field's

- Summary
- Description

Are mandatory

If you do not fill them you will get a screen like below



* Summary: Gears for sams widget twisted

You must enter a Summary for this bug.

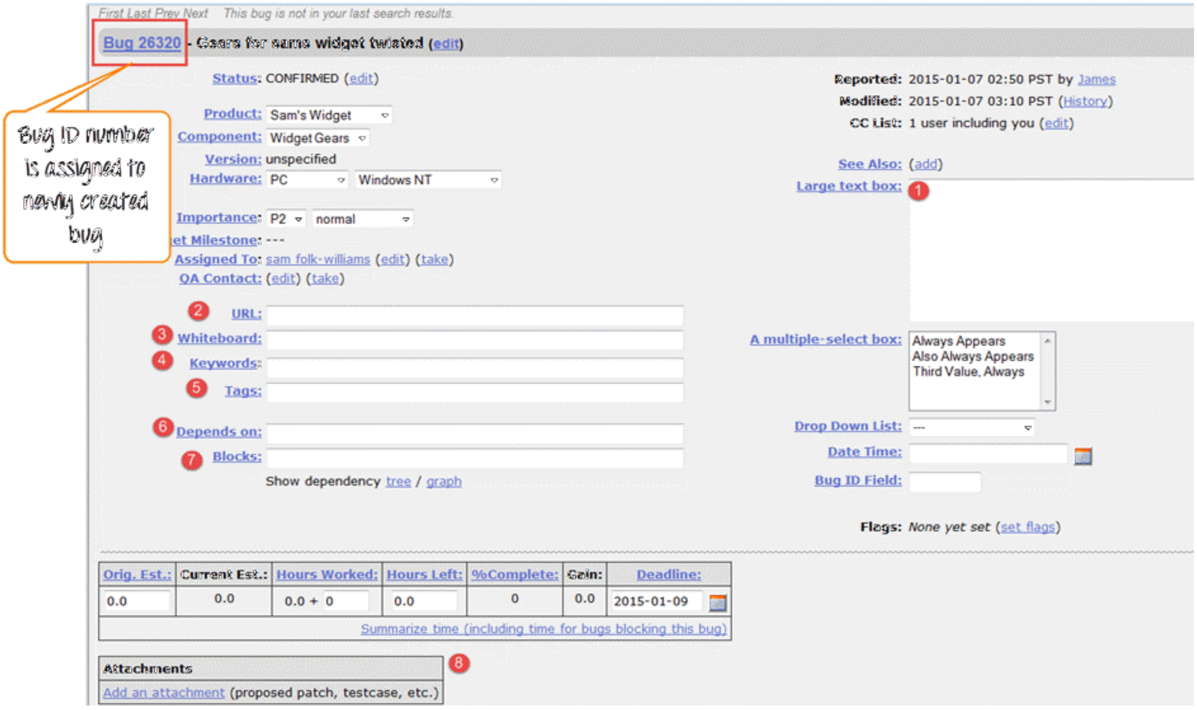
Possible Duplicates:

Bug ID	Summary	Status	
7776	when using the Widget Gears, the mV signal unexpectedly goes to 0	CONFIRMED	Add Me to the CC List
7777	Widget Gears causes wrong mV signal to appear	CONFIRMED	Add Me to the CC List
12431	Widget Gears cannot start	IN_PROGRESS	Add Me to the CC List
12480	The Gear of sams widgets failed its validation	CONFIRMED	Add Me to the CC List
15407	Sams Widget came pipe	CONFIRMED	Add Me to the CC List
21019	Gears are bound up	CONFIRMED	Add Me to the CC List
21841	Widget gears are stuck	CONFIRMED	Add Me to the CC List

Description: The widget gears are twisted at the end and not showing correct signal

Step 4) Bug is created ID# 26320 is assigned to our Bug. You can also add additional information to the assigned bug like URL, keywords, whiteboard, tags, etc. This extra-information is helpful to give more detail about the Bug you have created.

1. Large text box
2. URL
3. Whiteboard
4. Keywords
5. Tags
6. Depends on
7. Blocks
8. Attachments



First Last Prev Next This bug is not in your last search results.

Bug 26320 - Gears for sams widget twisted (edit)

Bug ID number is assigned to newly created bug

Status: CONFIRMED (edit)

Product: Sam's Widget

Component: Widget Gears

Version: unspecified

Hardware: PC Windows NT

Importance: P2 normal

et Milestone: ---

Assigned To: sam folk-williams (edit) (take)

QA Contact: (edit) (take)

Reported: 2015-01-07 02:50 PST by James

Modified: 2015-01-07 03:10 PST (History)

CC List: 1 user including you (edit)

See Also: (add)

1 Large text box:

2 URL:

3 Whiteboard:

4 Keywords:

5 Tags:

6 Depends on:

7 Blocks:

Show dependency tree / graph

A multiple-select box: Always Appears
Also Always Appears
Third Value, Always

Drop Down List: ---

Date Time:

Bug ID Field:

Flags: None yet set (set flags)

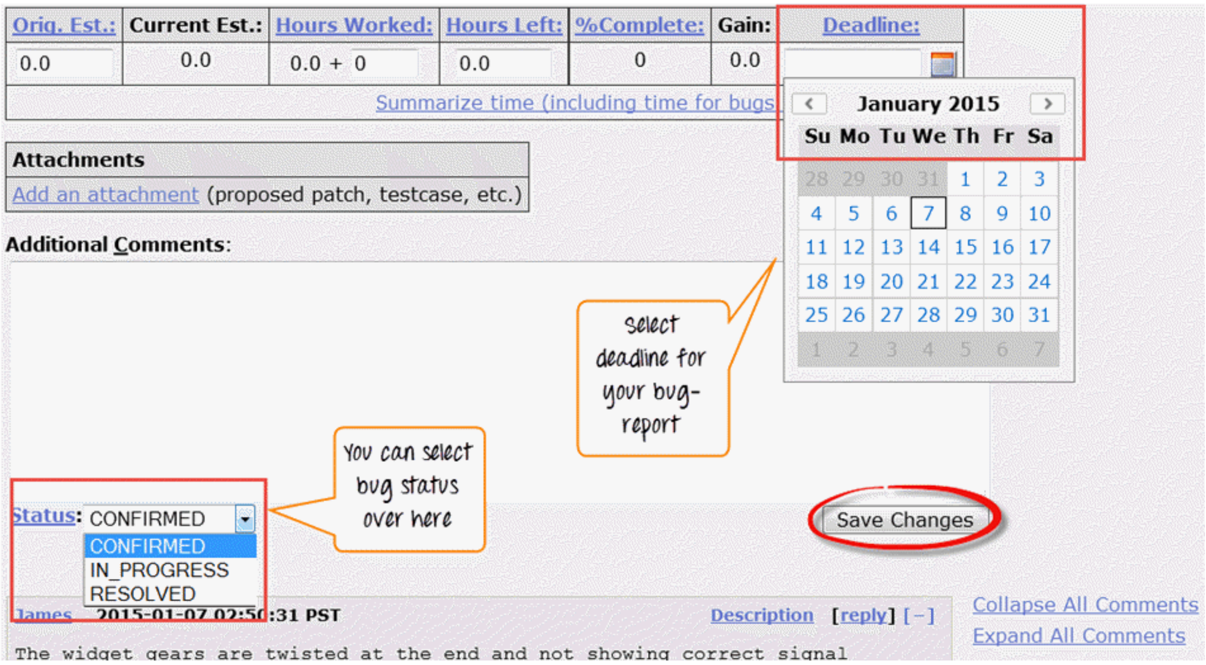
Orig. Est.:	Current Est.:	Hours Worked:	Hours Left:	%Complete:	Gain:	Deadline:
0.0	0.0	0.0 + 0	0.0	0	0.0	2015-01-09

Summarize time (including time for bugs blocking this bug)

8 Attachments

Add an attachment (proposed patch, testcase, etc.)

Step 5) In the same window if you scroll down further. You can select the deadline date and also the status of the bug. Deadline in Bugzilla usually gives the time-limit to resolve the bug in a given time frame.



Orig. Est.:	Current Est.:	Hours Worked:	Hours Left:	%Complete:	Gain:	Deadline:
0.0	0.0	0.0 + 0	0.0	0	0.0	

Summarize time (including time for bugs

January 2015

Su	Mo	Tu	We	Th	Fr	Sa
28	29	30	31	1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31
1	2	3	4	5	6	7

Attachments

Add an attachment (proposed patch, testcase, etc.)

Additional Comments:

Select deadline for your bug-report

You can select bug status over here

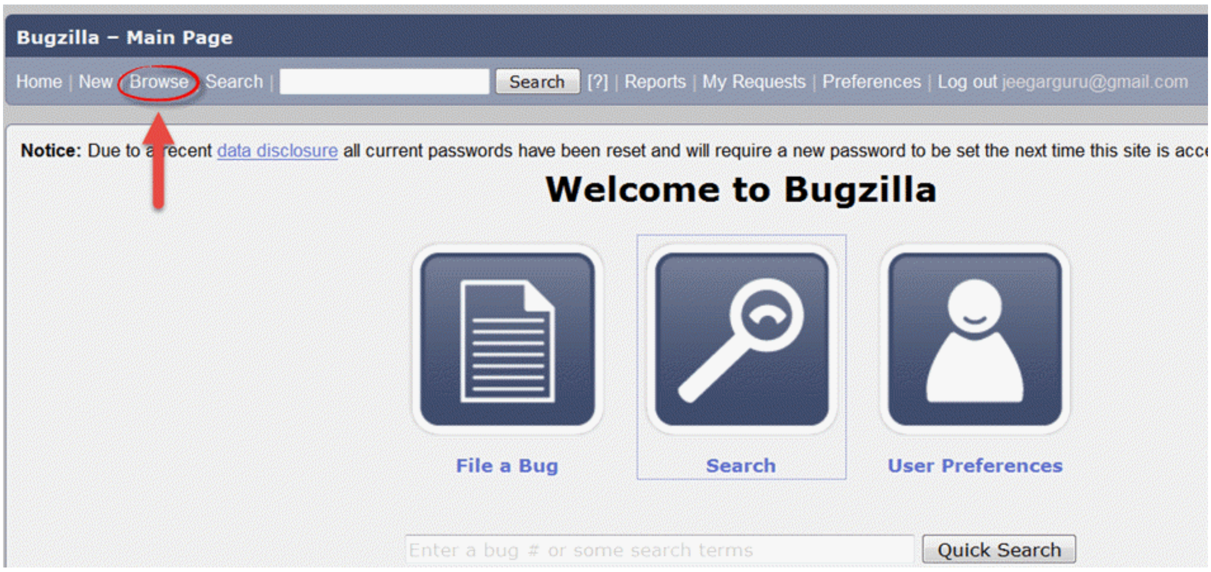
Status: CONFIRMED
CONFIRMED
IN_PROGRESS
RESOLVED

James 2015-01-07 02:50:31 PST Description [reply] [-]

The widget gears are twisted at the end and not showing correct signal

Browse Function

Step 1) To locate your bug we use the browse function, click on Browse button from the main menu.



Bugzilla – Main Page
Home | New | Browse | Search | Search [?] | Reports | My Requests | Preferences | Log out jeegarguru@gmail.com

Notice: Due to a recent data disclosure all current passwords have been reset and will require a new password to be set the next time this site is acc

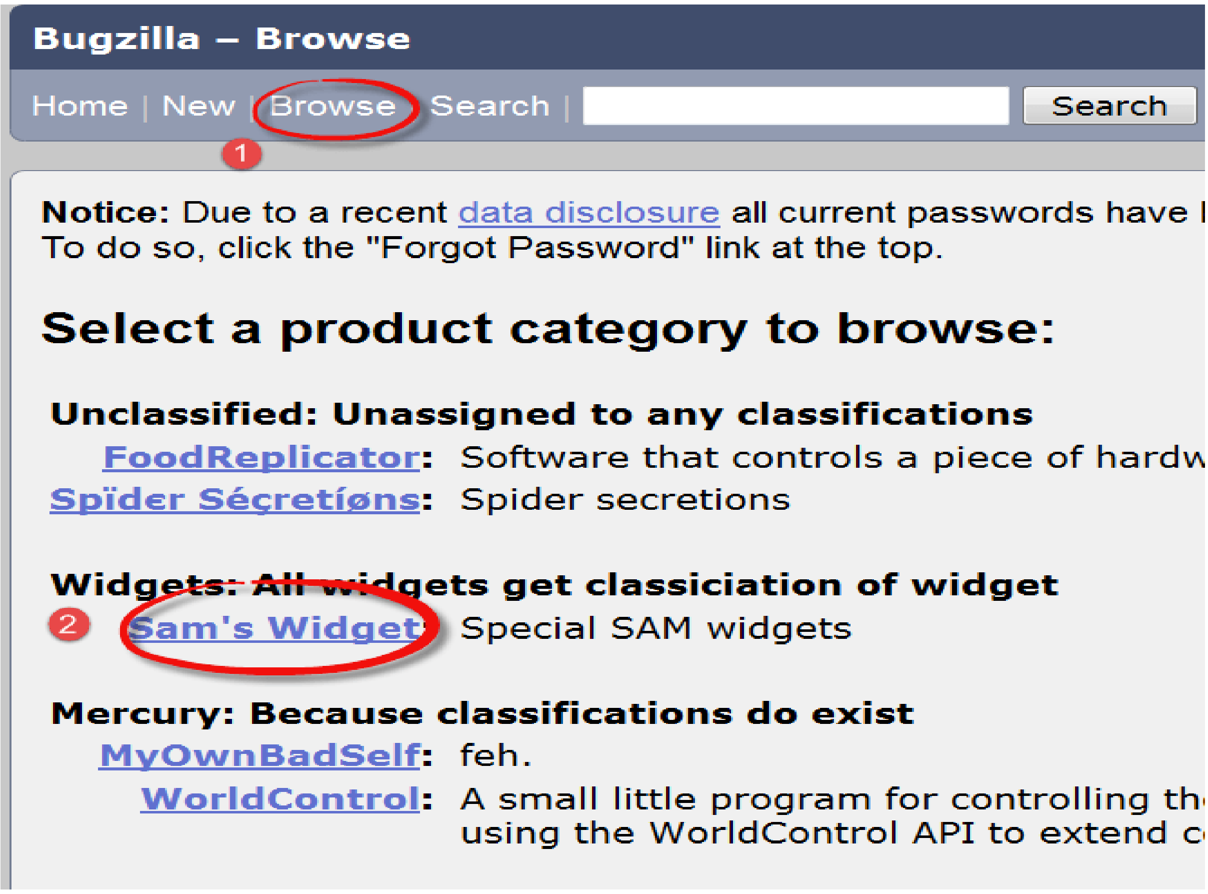
Welcome to Bugzilla

File a Bug
Search
User Preferences
Enter a bug # or some search terms
Quick Search

Step 2) As soon as you click on browse button a window will open saying "Select a product category to browse" as shown below, we browse the bug according to the category.

After clicking the browse button

Select the product "Sam's Widget" as such you have created a bug inside it.



Notice: Due to a recent data disclosure all current passwords have l
To do so, click the "Forgot Password" link at the top.

Select a product category to browse:

Unclassified: Unassigned to any classifications

FoodReplicator:	Software that controls a piece of hardw
Spïder Sécretíøns:	Spider secretions

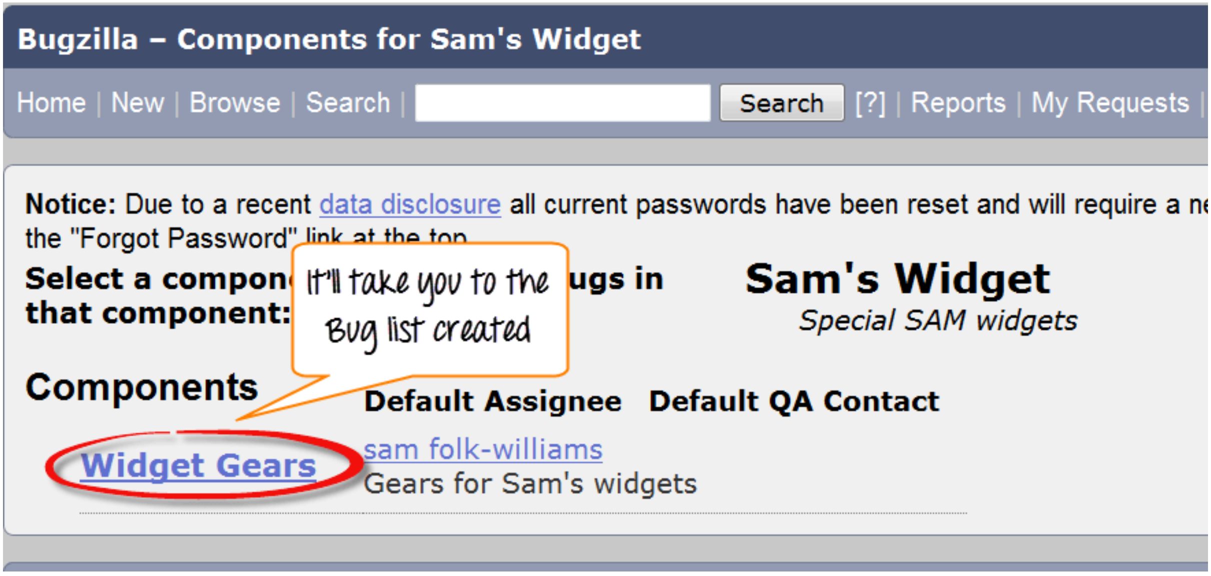
Widgets: All widgets get classiciation of widget

Sam's Widget:	Special SAM widgets

Mercury: Because classifications do exist

MyOwnBadSelf:	feh.
WorldControl:	A small little program for controlling th using the WorldControl API to extend c

Step 3) It opens another window, in this click on component "widget gears". Bugzilla Components are sub-sections of a product. For instance, where our product is SAM'S WIDGET whose component is WIDGET GEARS.


Bugzilla – Components for Sam's Widget
Home | New | Browse | Search | Search [?] | Reports | My Requests |
It'll take you to the Bug list created

Notice: Due to a recent data disclosure all current passwords have been reset and will require a ne
the "Forgot Password" link at the top

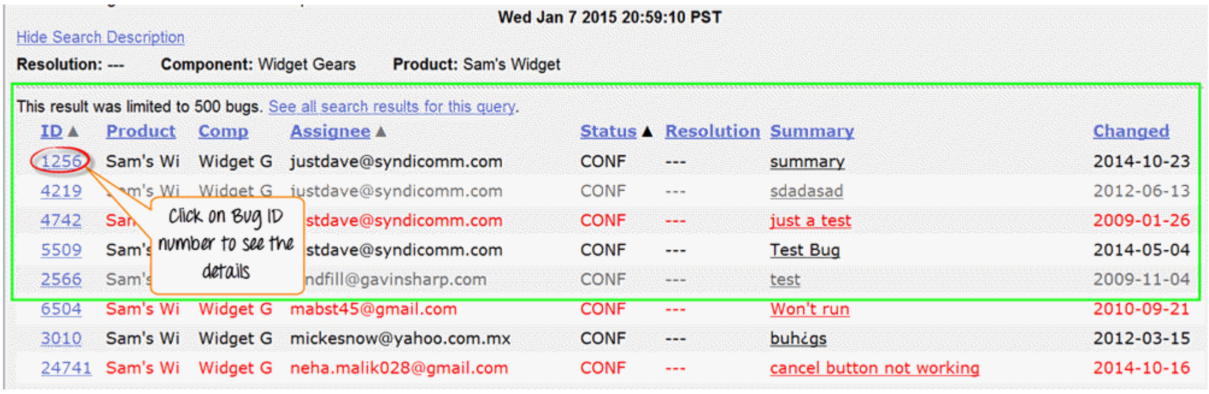
Select a compon ugs in that component:

Sam's Widget
Special SAM widgets

Components

	Default Assignee	Default QA Contact
Widget Gears	sam folk-williams Gears for Sam's widgets	

Step 4) when you click on the component, it will open another window. All the Bugs created under a particular category will be listed over here. From that Bug-list, choose your Bug#ID to see more details about the bug.



Wed Jan 7 2015 20:59:10 PST

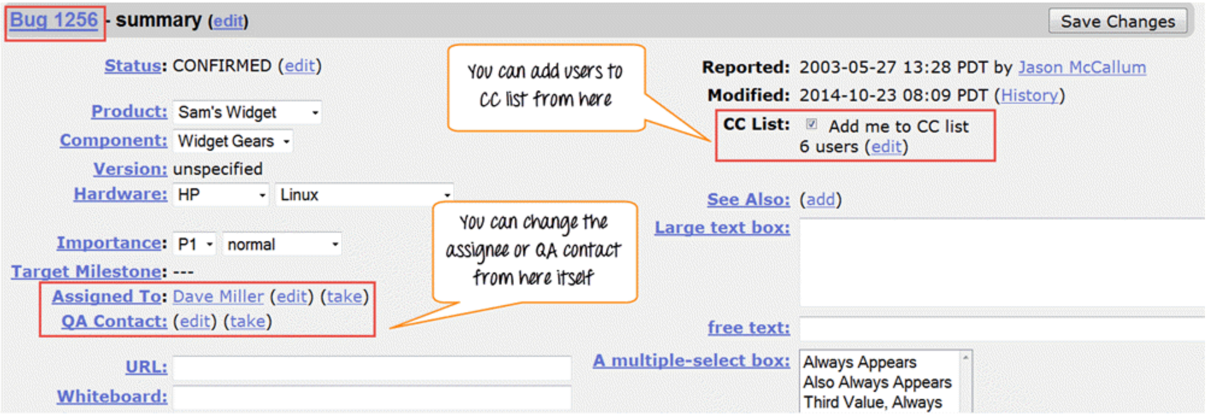
Hide Search Description

Resolution: --- **Component:** Widget Gears **Product:** Sam's Widget

This result was limited to 500 bugs. See all search results for this query.

ID ▲	Product	Comp	Assignee ▲	Status ▲	Resolution	Summary	Changed
1256	Sam's Wi	Widget G	justdave@syndicomm.com	CONF	---	summary	2014-10-23
4219	m's Wi	Widget G	justdave@syndicomm.com	CONF	---	sdadasad	2012-06-13
4742	Sa		stdave@syndicomm.com	CONF	---	just a test	2009-01-26
5509	Sam's		stdave@syndicomm.com	CONF	---	Test Bug	2014-05-04
2566	Sam's		ndfill@gavinsharp.com	CONF	---	test	2009-11-04
6504	Sam's Wi	Widget G	mabst45@gmail.com	CONF	---	Won't run	2010-09-21
3010	Sam's Wi	Widget G	mickesnow@yahoo.com.mx	CONF	---	buhćgs	2012-03-15
24741	Sam's Wi	Widget G	neha.malik028@gmail.com	CONF	---	cancel button not working	2014-10-16

It will open another window, where information about your bug can be seen more in detail. In the same window, you can also change the assignee, QA contact or CC list.



Bug 1256 - **summary** (edit)

Status: CONFIRMED (edit)

Product: Sam's Widget

Component: Widget Gears

Version: unspecified

Hardware: HP Linux

Importance: P1 normal

Target Milestone: ---

Assigned To: Dave Miller (edit) (take)

QA Contact: (edit) (take)

URL:

Whiteboard:

Reported: 2003-05-27 13:28 PDT by Jason McCallum

Modified: 2014-10-23 08:09 PDT (History)

CC List: ☑ Add me to CC list
6 users (edit)

See Also: (add)

Large text box:

free text:

A multiple-select box: Always Appears
Also Always Appears
Third Value, Always

You can add users to CC list from here
You can change the assignee or QA contact from here itself

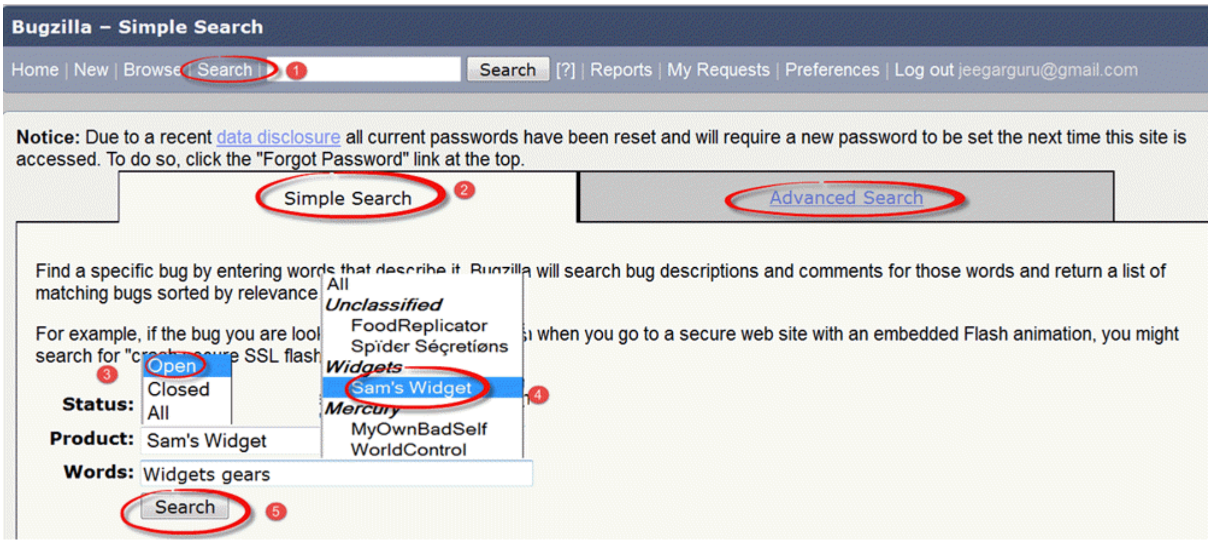
How to use Simple search option in Bugzilla

Bugzilla provides two ways of searching for bugs, they are Simple Search and Advance Search methods.

Step 1) We will first learn the "Simple Search" method. Click on search button from the main menu and then follow these steps

1. Click on "Simple Search" button

2. Choose the status of the Bug – choose Open if you are looking the bug in Open status and closed for bug in closed status
3. Choose your category and component, and you can also put keywords related to your bug
4. Click on the search



Notice: Due to a recent data disclosure all current passwords have been reset and will require a new password to be set the next time this site is accessed. To do so, click the "Forgot Password" link at the top.

Find a specific bug by entering words that describe it. Bugzilla will search bug descriptions and comments for those words and return a list of matching bugs sorted by relevance

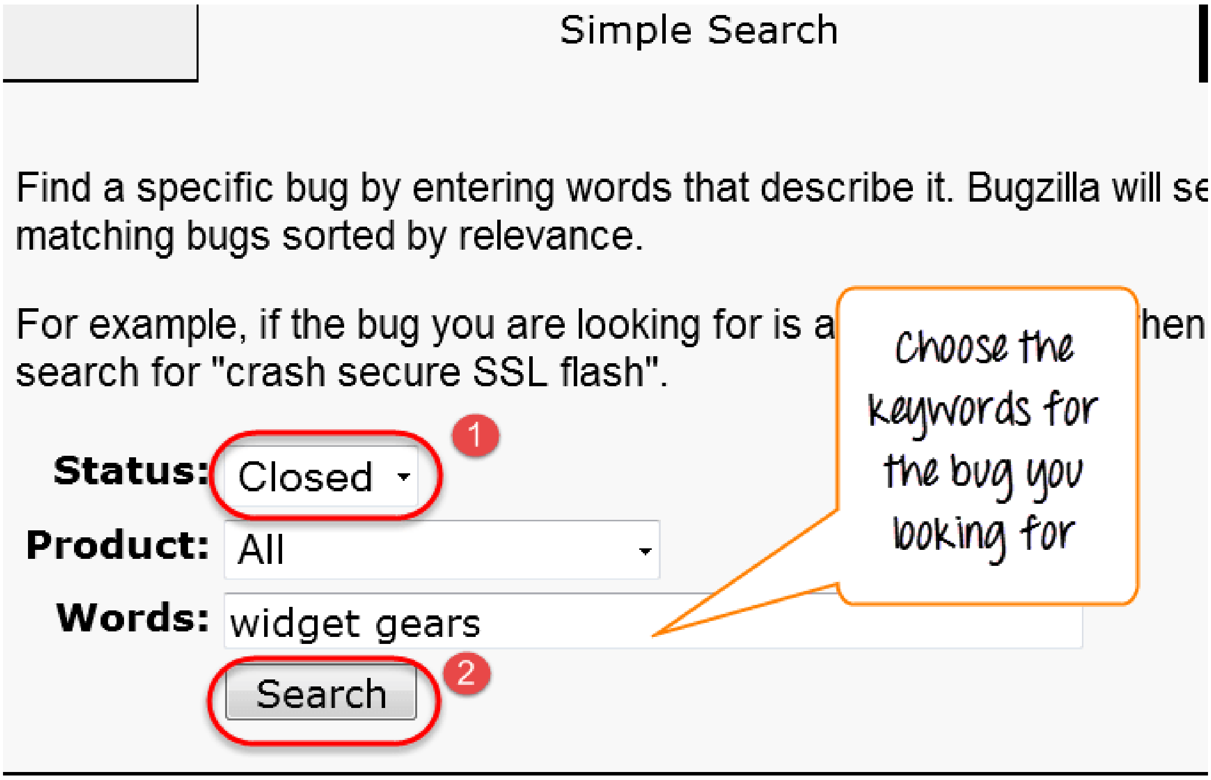
For example, if the bug you are look… when you go to a secure web site with an embedded Flash animation, you might search for "cr… SSL flash

Status: Open

Product: Sam's Widget

Words: Widgets gears

Step 2) Here we will search for both option open and closed status, first we have selected closed status for bugs and clicked the search button.



Simple Search

Find a specific bug by entering words that describe it. Bugzilla will se
matching bugs sorted by relevance.

For example, if the bug you are looking for is a hen
search for "crash secure SSL flash".

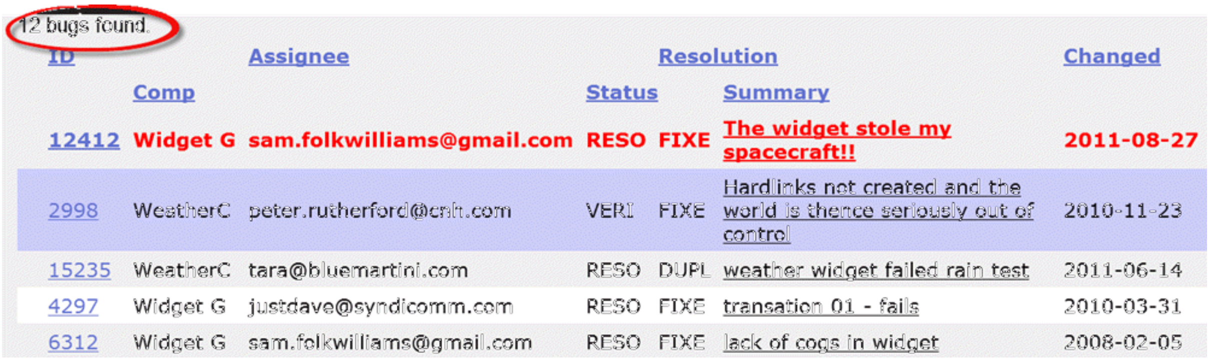
Status: Closed

Product: All

Words: widget gears

Choose the keywords for the bug you looking for

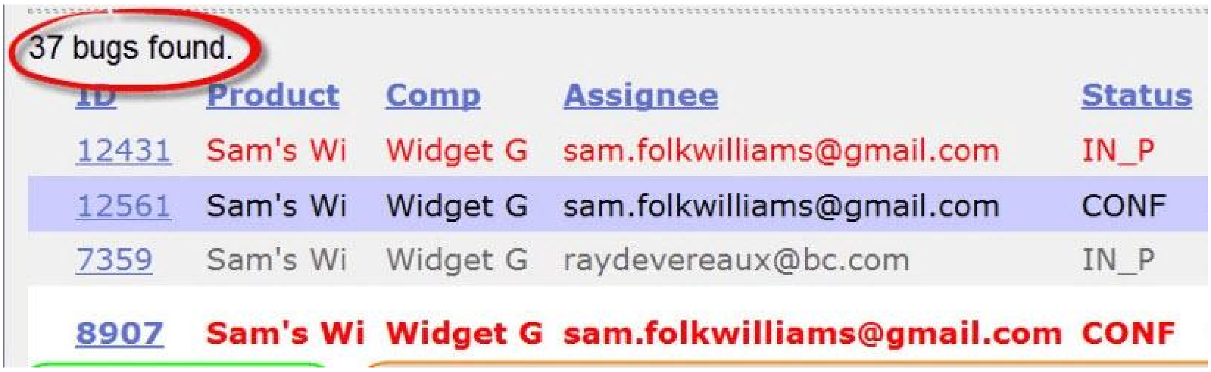
For closed status, it fetched 12 bugs.



12 bugs found.

ID	Comp	Assignee	Status	Resolution	Summary	Changed
12412	Widget G	sam.folkwilliams@gmail.com	RESO	FIXE	The widget stole my spacecraft!!	2011-08-27
2998	WeatherC	peter.rutherford@cnft.com	VERI	FIXE	Hardlinks not created and the world is thence seriously out of control	2010-11-23
15235	WeatherC	tara@bluemartini.com	RESO	DUPL	weather widget failed rain test	2011-06-14
4297	Widget G	justdave@syndicomm.com	RESO	FIXE	transation 01 - fails	2010-03-31
6312	Widget G	sam.folkwilliams@gmail.com	RESO	FIXE	lack of cogs in widget	2008-02-05

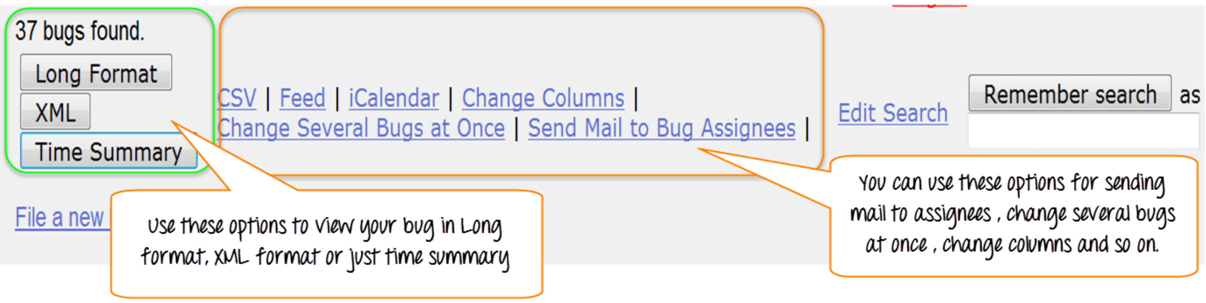
Step 3) Likewise we have searched for Open status as well, and it has fetched 37 bugs related to our queries.



37 bugs found.

ID	Product	Comp	Assignee	Status
12431	Sam's Wi	Widget G	sam.folkwilliams@gmail.com	IN_P
12561	Sam's Wi	Widget G	sam.folkwilliams@gmail.com	CONF
7359	Sam's Wi	Widget G	raydevereaux@bc.com	IN_P
8907	Sam's Wi	Widget G	sam.folkwilliams@gmail.com	CONF

Also, at the bottom of the screen you have various options like how you want to see your bug - an XML format, in Long format or just Time summary. Apart from that you can also use other options like send mail to bug assignee, change several bugs at once or change column of the screen, etc.


37 bugs found.
Long Format
XML
Time Summary
File a new
CSV | Feed | iCalendar | Change Columns |
Change Several Bugs at Once | Send Mail to Bug Assignees |
Edit Search
Remember search as

Use these options to View your bug in Long format, XML format or just time summary

You can use these options for sending mail to assignees, change several bugs at once, change columns and so on.

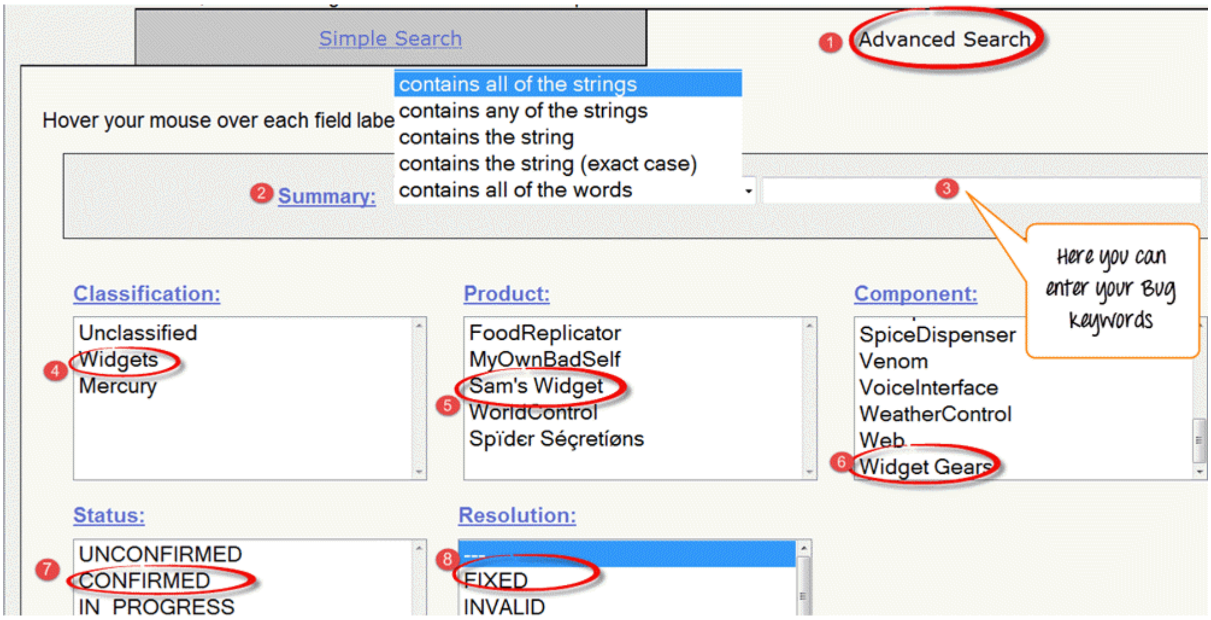
In the next step, we will demonstrate one of these function change columns of the screen, through which we will learn how to add or remove the column to the existing column.

How to use Advanced Search in Bugzilla

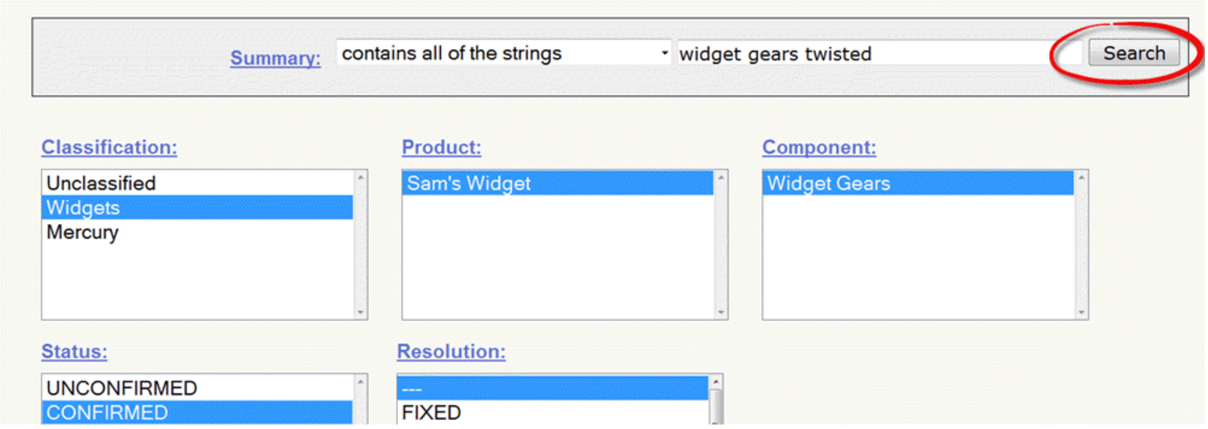
Step 1) After a Simple search we will look into the Advanced Search option for that you have to follow the following steps.

1. Click on the advanced search option
2. Select option for a summary, how you want to search
3. Enter the keyword for your bug- for example, Widget gears twisted
4. Select the category of your Bug under classification, here we selected Widget

5. Choose your product under which your Bug was created- Sam's Widget
6. Component- Widget gears
7. Status- Confirmed
8. Resolution

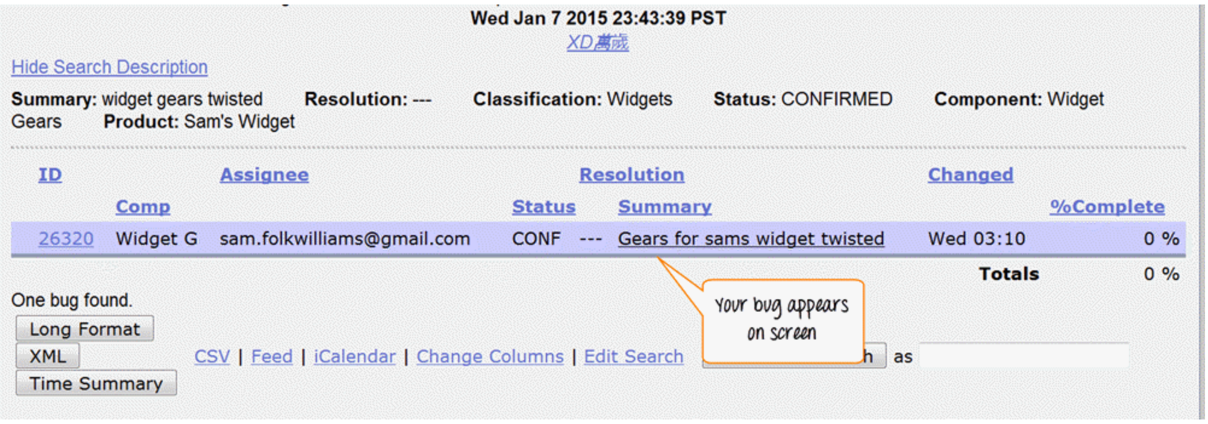


Step 2) Once you select all the option, click on search button. It will detect the bug you created



Summary: contains all of the strings widget gears twisted

The advanced search will find your bug, and it will appear on the screen like this



Wed Jan 7 2015 23:43:39 PST

XD萬歲

Hide Search Description

Summary: widget gears twisted **Resolution:** --- **Classification:** Widgets **Status:** CONFIRMED **Component:** Widget Gears **Product:** Sam's Widget

ID	Comp	Assignee	Status	Resolution	Summary	Changed	%Complete
26320	Widget G	sam.folkwilliams@gmail.com	CONF	---	Gears for sams widget twisted	Wed 03:10	0 %
						Totals	0 %

One bug found.

Your bug appears on screen

Jmeter

The **Apache JMeterTM** is pure Java **open source** software, which was first developed by Stefano Mazzocchi of the Apache Software Foundation, designed to load test functional behavior and measure performance. You can use JMeter to analyze and measure the performance of web applications or a variety of services. Performance Testing means testing a web application against heavy load, multiple and concurrent user traffic. JMeter originally is used for testing Web Application or FTP application. Nowadays, it is used for a functional test, database server test etc.

JMeter Advantages

- **Open source license**: JMeter is totally free, allows developer use the source code for the development
- **Friendly GUI**: JMeter is extremely easy to use and doesn't take time to get familiar with it
- **Platform independent**: JMeter is 100% pure Java desktop application. So it can run on multiple platforms
- **Full multithreading framework**. JMeter allows concurrent and simultaneous sampling of different functions by a separate thread group
- **Visualize Test Result:** Test result can be displayed in a different format such as chart, table, tree and log file
- **Easy installation**: You just copy and run the *.bat file to run JMeter. No installation needed.
- **Highly Extensible**: You can write your own tests. JMeter also supports visualization plugins allow you to extend your testing
- **Multiple testing strategy**: JMeter supports many testing strategies such as Load Testing, Distributed Testing, and Functional Testing.
- **Simulation**: JMeter can simulate multiple users with concurrent threads, create a heavy load against web application under test

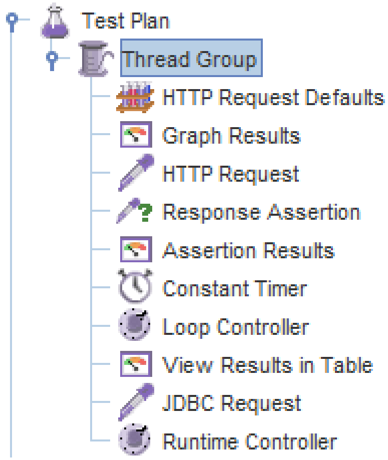
- **Support multi-protocol**: JMeter does not only support web application testing but also evaluates database server performance. All basic protocols such as HTTP, JDBC, LDAP, SOAP, JMS, and FTP are supported by JMeter
- **Record & Playback** - **Record** the user activity on the browser and simulate them in a web application using JMeter
- **Script Test**: Jmeter can be integrated with Bean Shell & Selenium for automated testing.

What is a Test Plan?

Test Plan is where you add elements required for your JMeter Test.

it stores all the elements (like ThreadGroup, Timers etc) and their corresponding settings required to run your desired Tests.

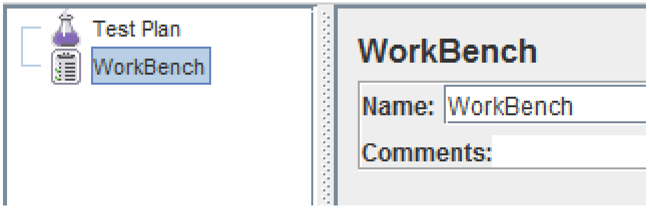
The following figure shows an example of Test Plan



Test Plan
Thread Group
HTTP Request Defaults
Graph Results
HTTP Request
Response Assertion
Assertion Results
Constant Timer
Loop Controller
View Results in Table
JDBC Request
Runtime Controller

What is WorkBench?

The WorkBench simply provides a place to store test elements **temporarily**. WorkBench has no relation with Test Plan. JMeter will **not save** the contents of the WorkBench. It only saves the contents of the Test Plan branch



WorkBench

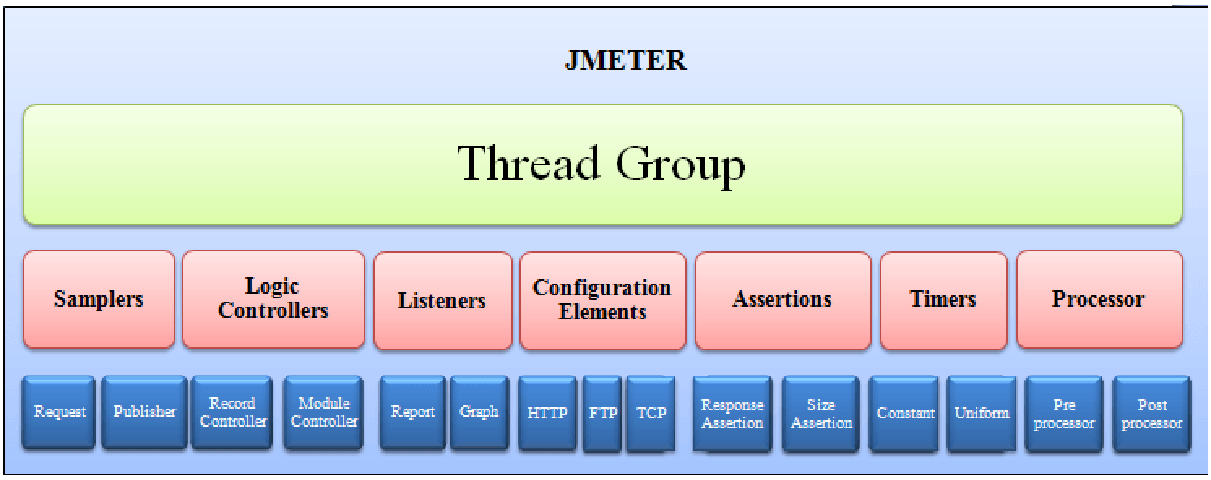
Name: WorkBench

Comments:

"WorkBench" will be used in our tutorial HTTP Proxy Server Recording Test

What is Element in JMeter?

The different components of JMeter are called Elements. Each Element is designed for a specific purpose.



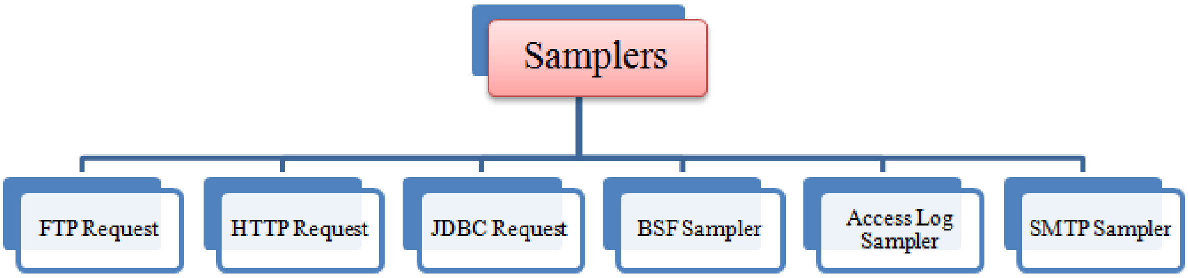
Thread Group

Thread Groups is a collection of Threads. Each thread represents one user using the application under test. Basically, each Thread simulates one real user request to the server.

The controls for a thread group allow you to Set the number of threads for each group.

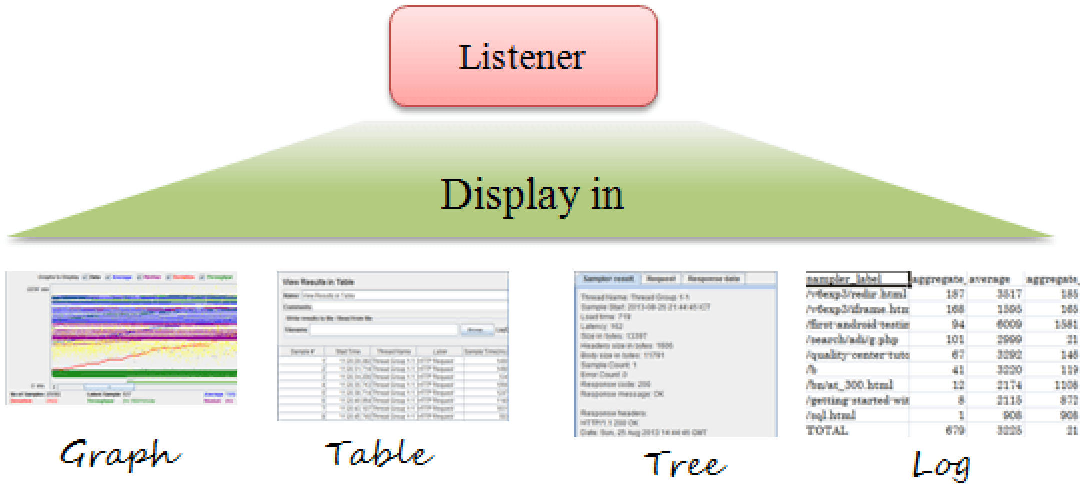
Samplers

As we already know, JMeter supports testing HTTP, FTP, JDBC and many other protocols.



Listeners

Listeners: shows the results of the test execution. They can show results in a different format such as a tree, table, graph or log file.



Sampler result | Request | Response data

Thread Name: Thread Group 1-1
Sample Start: 2013-08-25 21:44:45 IST
Load time: 719
Latency: 162
Size in bytes: 13397
Headers size in bytes: 1606
Body size in bytes: 11791
Sample Count: 1
Error Count: 0
Response code: 200
Response message: OK

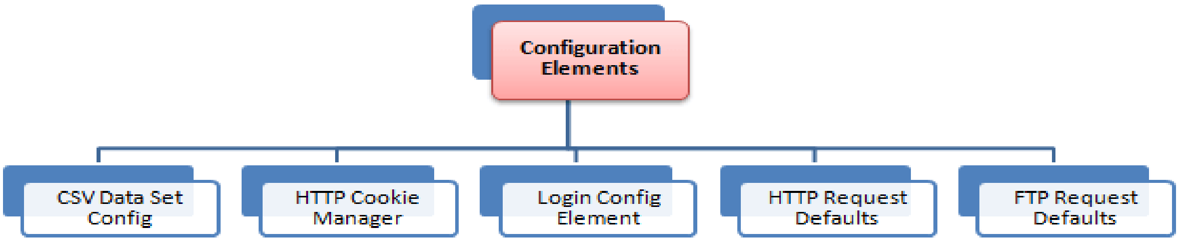
Response headers:
HTTP/1.1 200 OK
Date: Sun, 25 Aug 2013 14:44:45 GMT

sampler_label	aggregate_	average	aggregate_
/v6exp3/redir.html	187	3517	185
/v6exp3/iframe.htm	168	1595	165
/first-android-testin	94	6009	1581
/search/ads/g.php	101	2999	21
/quality-center-tuto	67	3292	148
/h	41	3220	119
/hn/at_300.html	12	2174	1108
/getting-started-wit	8	2115	872
/sql.html	1	908	908
TOTAL	679	3225	21

Configuration Elements

set up defaults and variables for later use by samplers.

The figure below shows some commonly used configuration elements in JMeter



Sonarqube;

SonarQube Integration is an open source static code analysis tool that has become quite popular in recent times. It can integrate with your existing workflow to enable continuous code inspection across your project branches and pull requests. It is an (previously known as Sonar) is an open source platform for Continuous Inspection of code quality. It is written in java and supported for 25+ languages such as Java, C/C++, C#, PHP, Flex, Groovy, JavaScript, Python, PL/SQL, COBOL, etc, it is also used for Android Development.

It helps for various tasks and provides reports on duplicated code, coding standards, unit tests, code coverage, complex code, potential bugs, comments and design and architecture.

SonarQube Features :

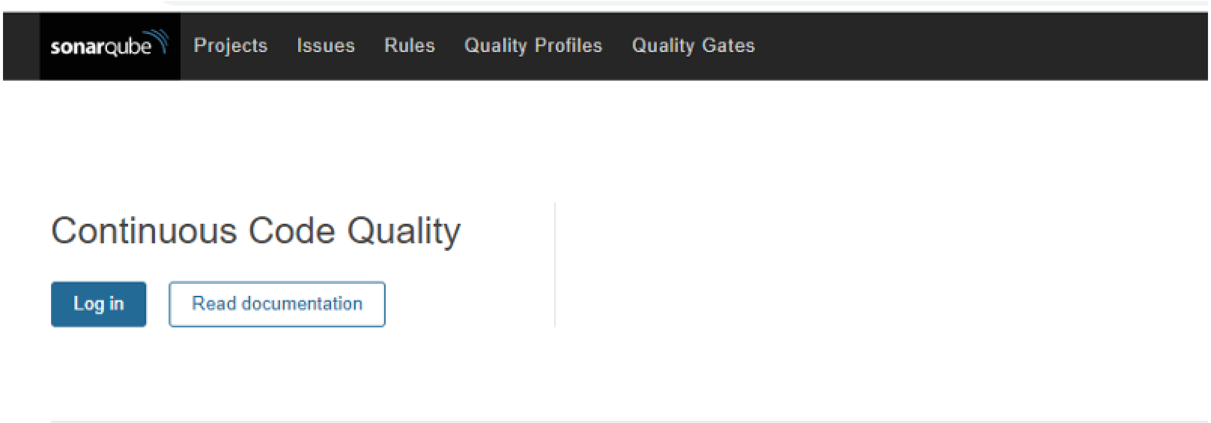
- Supports languages: Java, C/C++, Objective-C, C#, PHP, Flex, Groovy, JavaScript, Python, PL/SQL, COBOL, etc. (note that some of them are commercial)
- Can also be used in Android development.
- Offers reports on duplicated code, coding standards, unit tests, code coverage, code complexity, potential bugs, comments, design, and architecture.
- Records metrics history and provides evolution graphs (“time machine”) and differential views.
- Provides fully automated analyses: integrates with Maven, Ant, Gradle, and continuous integration tools (Atlassian Bamboo, Jenkins, Hudson, etc.).
- Integrates with the Eclipse development environment
- Integrates with external tools: JIRA, Mantis, LDAP, Fortify, etc.

SonarQube Installation on Windows

1. Download SonarQube: https://www.sonarqube.org/downloads/
   * Download the latest stable version and extract the .zip on to the local system.

2. Extract the Sonarqube zip file and open bin folder and click \windows-x86-64 then open StartSonar and run it.

3.. Once the SonarQube is up, go to the browser : http://localhost:9000 to access SonarQube dashboard

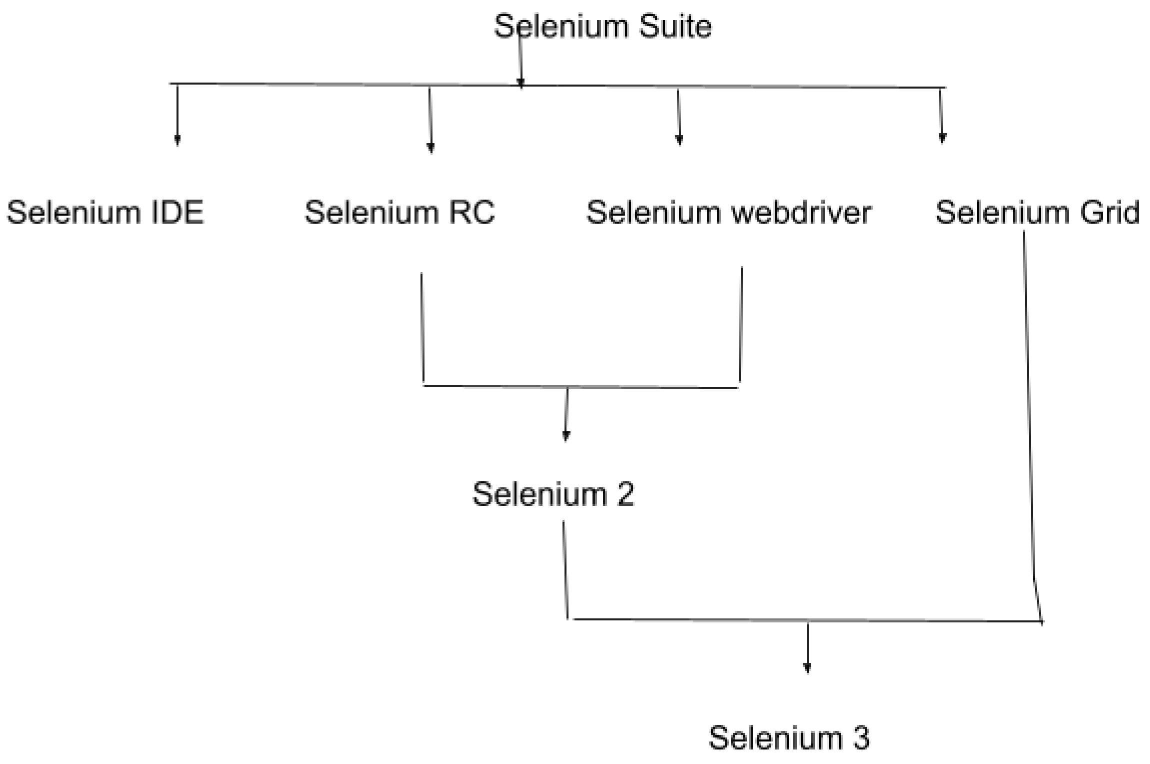


4.Login with default credentials (admin both as userId and Password).

5.Go to Administration -> Security ->Generate token (copy and save the token for future use, e.g. while integrating with Jenkins).

SELENIUM

- It is an open source web application testing tool.
- Set platform independent (all OS,browsers).
- Supports all programming languages (C,C#,Python,Java etc).
- Selenium is not a single tool,but a suite of softwares.



Comparison between selenium & QTP

Selenium

1. Open source & free to use
2. Can run test different browsers
3. Support mobile devices
4. Support different programming languages
5. Can execute test parallely

QTP

1. Commercial use
2. Can run firefox,IE,chrome

3. Supports only windows
4. It supports mobile devices,QC third party software.
5. Supports only VB scripts
6. Can only execute parallel but using QC.

Advantages of QTP over Selenium

QTP

1. Can test both web & window based application
2. Test report generated automatically
3. Data driven testing is easily performed,because it has built in global and local data table.
4. QTP has built in object repository

Selenium

1. Can test only web based applications
2. No native support to generate test reports.
3. Data driven testing is difficult.
4. It has no built-in object repository.

Selenium IDE

- It is a firefox plugin so it can be used only with firefox browsers.
- Using IDE we cannot record flash and silver lights.
- It did not support file uploads.

Advantages

1. Very easy to use and install.
2. No programming experience is required
3. Can export tests to format usable in selenium RC and webdriver.

Disadvantages

1. Available only in firefox.
2. No support for iteration and conditional operations.
3. Test result not generated automatically.

Element Locators

Locators is an address that identifies a web element uniquely within the web page.Locators tell selenium IDE which GUI elements it needs to operation.Example of GUI elements are text box,buttons,checkbox.To create an automation script a selenium provides number of locators precisely locate a GUI element.

Different types of locators

- Id

  id=id of the element
- Name

  name=name of the element
- Class

  class=class of the element
- Link

  Link =link of the element
- Xpath

  Xpath is used to locate a web element based on XML path.XML stands for Extensible Markup Language,and it is used to store,organise and transport datas.

  Two types of xpath

  1.Relative path

  2.Absolute Path
- CSS selector

  It is a combination of an element selector and a selector value which identify the web element within a web page.

Selenium Webdriver

Selenium WebDriver is the most important component of Selenium Tool's Suite. The latest release "Selenium 4.0" is integrated with WebDriver API which provides a simpler and more concise programming interface.

In WebDriver, test scripts can be developed using any of the supported programming languages and can be run directly in most modern web browsers. Languages supported by WebDriver include C#, Java, Perl, PHP, Python and Ruby.

Selenium WebDriver performs much faster as compared to Selenium RC because it makes direct calls to the web browsers. RC on the other hand needs an RC server to interact with the browser.

WebDriver has a built-in implementation of Firefox driver (Gecko Driver). For other browsers, you need to plug-in their browser specific drivers to communicate and run the test. Most commonly used WebDriver's include:

- Google Chrome Driver
- Internet Explorer Driver
- Opera Driver
- Safari Driver
- HTML Unit Driver (a special headless driver)

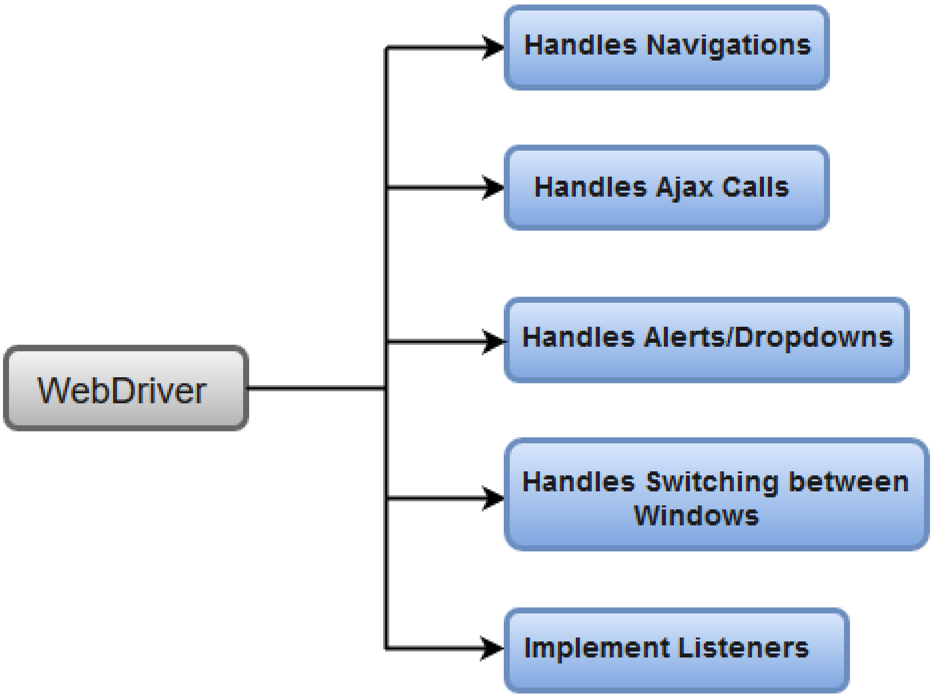
Selenium WebDriver- Features:

- **Multiple Browser Support**: Selenium WebDriver supports a diverse range of web browsers such as Firefox, Chrome, Internet Explorer, Opera and many more. It also supports some of the non-conventional or rare browsers like HTMLUnit.
- **Multiple Languages Support**: WebDriver also supports most of the commonly used programming languages like Java, C#, JavaScript, PHP, Ruby, Pearl and

Python. Thus, the user can choose any one of the supported programming language based on his/her competency and start building the test scripts.

- **Speed**: WebDriver performs faster as compared to other tools of Selenium Suite. Unlike RC, it doesn't require any intermediate server to communicate with the browser; rather the tool directly communicates with the browser.
- **Simple Commands**: Most of the commands used in Selenium WebDriver are easy to implement. For instance, to launch a browser in WebDriver following commands are used:

  WebDriver driver = **new FirefoxDriver();** (Firefox browser)
  WebDriver driver = **new ChromeDriver();** (Chrome browser)
  WebDriver driver = **new InternetExplorerDriver();** (Internet Explorer browser)



>>. **Download the Selenium Java Client Driver**

https://chromedriver.chromium.org/downloads

Selenium WebDriver- Installation:

*Download and Install Java latest version(jdk)

https://www.oracle.com/java/technologies/downloads/l

*Download and configure Eclipse or any Java IDE of your choice.

https://www.eclipse.org/downloads/

*Download Selenium WebDriver Java Client

https://www.selenium.dev/downloads/

*Configure Selenium WebDriver

>Launch Eclipse IDE

>Create a new Java Project from File > New > Other>Maven Project.

>>>>>>>First Selenium Automation Test Script.

Under this test, we will automate the following scenarios:

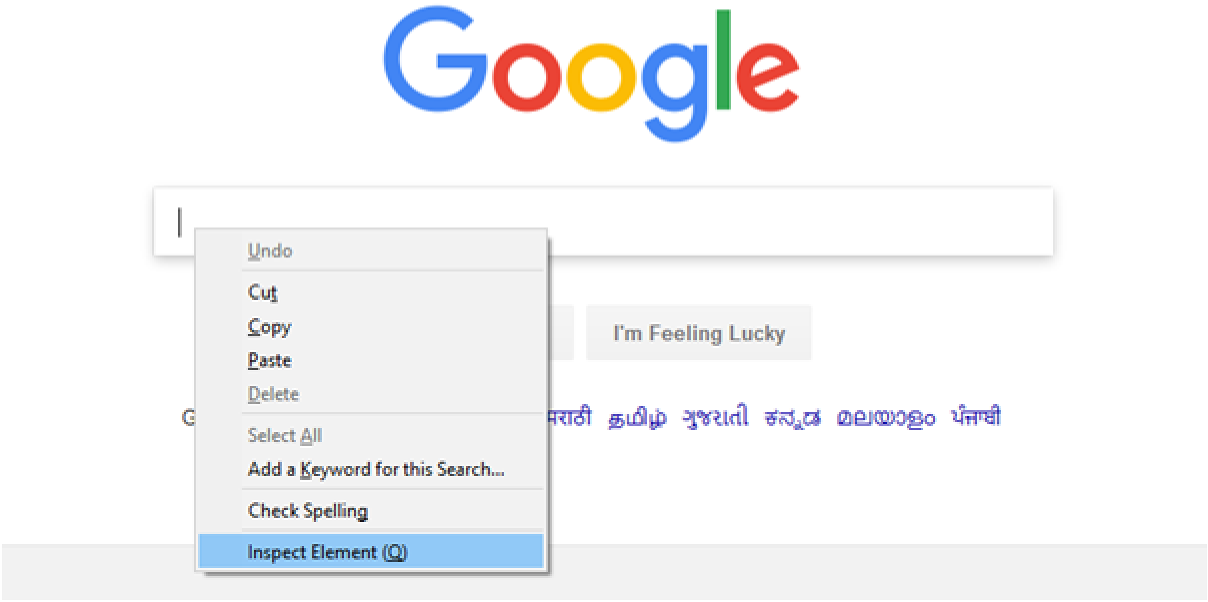
- Invoke Google Chrome browser.
- Open URL: www.google.com
- Click on the Google Search text box.
- Type the value "Selenium"
- Click on the Search button.

Step1. Launch Eclipse IDE and create maven project “NewProject”.

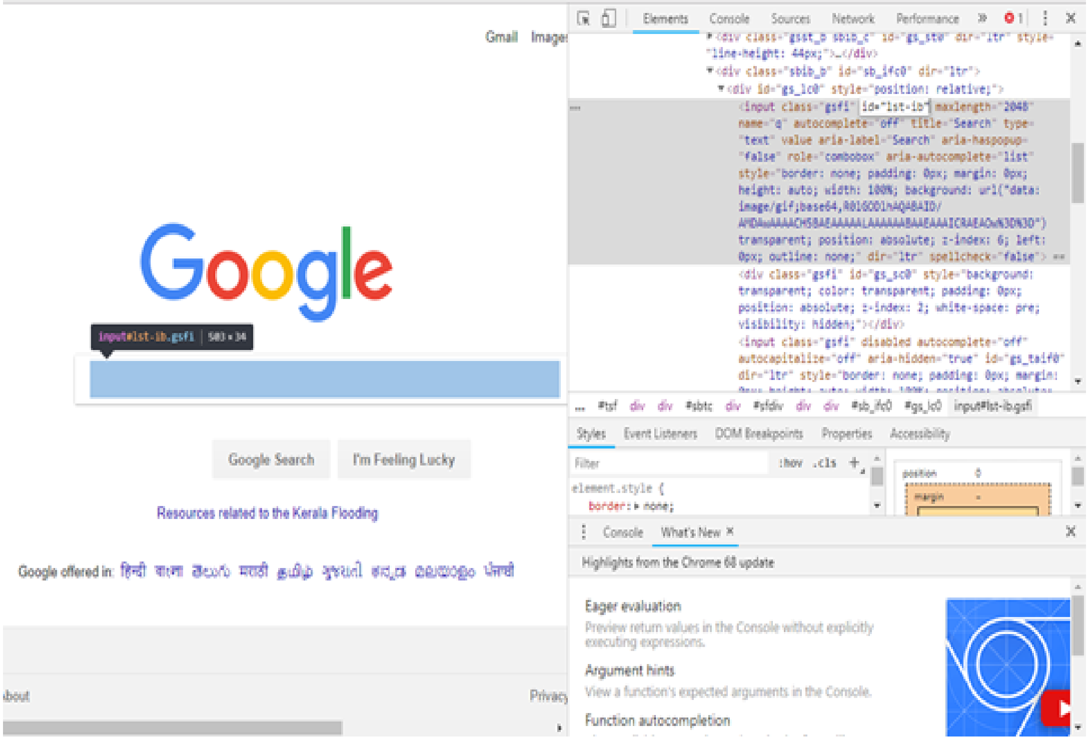
Add maven dependency file for selenium in pom.xml .

Step2: We would need a unique identification for the web elements like Google Search text box and Search button in order to automate them through our test script. These unique identifications are configured along with some Commands/Syntax to form Locators. Locators help us to locate and identify a particular web element in context of a web application.The method for finding a unique identification element involves inspection of HTML codes.

- Open URL: https://www.google.com in your Chrome browser.
- Right click on the Google search text box and select Inspect Element.



- It will launch a window containing all the specific codes involved in the development of the test box.



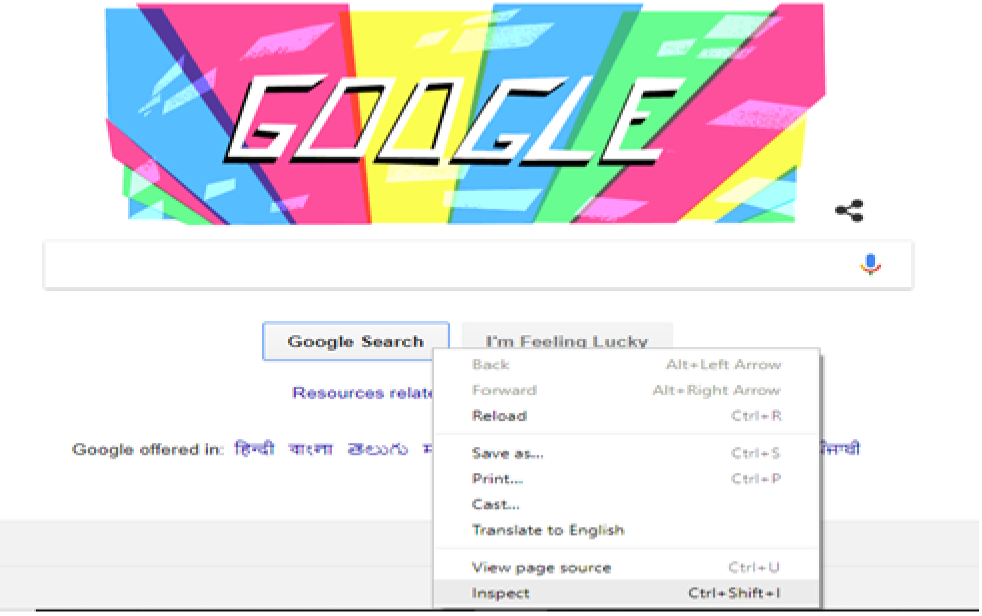
Gmail
Images
Google
input#lst-ib.gsfi | 583 × 34
Google Search
I'm Feeling Lucky
Resources related to the Kerala Flooding
Google offered in: हिन्दी বাংলা తెలుగు मराठी தமிழ் ગુજરાતી ಕನ್ನಡ മലയാളം ਪੰਜਾਬੀ
About
Privacy
Elements
Console
Sources
Network
Performance
Styles
Event Listeners
DOM Breakpoints
Properties
Accessibility
Filter
:hov .cls +
position
margin
Console
What's New ×
Highlights from the Chrome 68 update
Eager evaluation
Preview return values in the Console without explicitly executing expressions.
Argument hints
View a function's expected arguments in the Console.
Function autocompletion

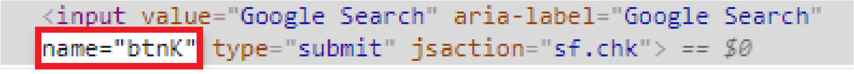
```
▸<div class="gsst_b sbib_c" id="gs_st0" dir="ltr" style=
"line-height: 44px;">…</div>
▾<div class="sbib_b" id="sb_ifc0" dir="ltr">
  ▾<div id="gs_lc0" style="position: relative;">
      <input class="gsfi" id="lst-ib" maxlength="2048"
      name="q" autocomplete="off" title="Search" type=
      "text" value aria-label="Search" aria-haspopup=
      "false" role="combobox" aria-autocomplete="list"
      style="border: none; padding: 0px; margin: 0px;
      height: auto; width: 100%; background: url("data:
      image/gif;base64,R0lGODlhAQABAID/
      AMDAwAAAACH5BAEAAAAALAAAAAABAAEAAAICRAEAOw%3D%3D")
      transparent; position: absolute; z-index: 6; left:
      0px; outline: none;" dir="ltr" spellcheck="false"> == $0
      <div class="gsfi" id="gs_sc0" style="background:
      transparent; color: transparent; padding: 0px;
      position: absolute; z-index: 2; white-space: pre;
      visibility: hidden;"></div>
      <input class="gsfi" disabled autocomplete="off"
      autocapitalize="off" aria-hidden="true" id="gs_taif0"
      dir="ltr" style="border: none; padding: 0px; margin:
```

```
... #tsf div div #sbtc div #sfdiv div div #sb_ifc0 #gs_lc0 input#lst-ib.gsfi
```

```
element.style {
  border: ▸ none;
```

- Pick the value of id element(pick any other locator strategy like class ,name etc) i.e. "lst-ib".
- Given below is the Java syntax for locating elements through "id" in Selenium WebDriver.
  - driver.findElement(By.id (<element ID>))
- Here is the complete code for locating Google Search text box in our test script.
  - driver.findElement(By.id ("lst-ib"))
- Now, right click on the Google Search button and select Inspect Element.



- It will launch a window containing all the specific codes involved in the development of the Google Search button.
- Pick the value of **name** element i.e. "btnK".
- 

```
<input value="Google Search" aria-label="Google Search"
name="btnK" type="submit" jsaction="sf.chk"> == $0
```

- Given below is the Java syntax for locating elements through "name" in Selenium WebDriver.
  - driver.findElement(By.name (<element name>))
- Here is the complete code for locating Google Search button in our test script.
  - driver.findElement(By.name ("btnK"))
- We have embedded comments for each block of code to explain the steps clearly.

```
import org.openqa.selenium.By;
import org.openqa.selenium.WebDriver;
import org.openqa.selenium.chrome.ChromeDriver;
public class First {
 public static void main(String[] args) {
```

```
 // declaration and instantiation of objects/variables

System.setProperty("webdriver.chrome.driver","D:\\ChromeDriver\\chromedriver.exe");
//A driver object is instantiated through:
  WebDriver driver=new ChromeDriver();
   // Launch website
  driver.navigate().to("http://www.google.com/");
    // Click on the search text box and send value
  driver.findElement(By.id("lst-ib")).sendKeys("javatpoint tutorials");
  // Click on the search button
  driver.findElement(By.name("btnK")).click();
  }  }
```

Selenium WebDriver- Commands

Selenium WebDriver can be broadly classified in following categories:

1. Browser Commands
2. Navigation Commands
3. WebElement Commands

Given below are some of the most commonly used Selenium commands in WebDriver:

1. Fetching a web page

There are two methods to fetch a web page:

>Using Get method: driver.get("url") ;

>Using Navigate method :driver.navigate().to("url");

2. Locating forms and sending user inputs:

```
driver.findElement(By.locatorstrategy("locatorstrategy value")).sendKeys("input any value");
```

3. Clearing User inputs

The clear() method is used to clear the user inputs from the text box.

```
driver.findElement(By.name("q")).clear();
```

4. Performing Click event

The click() method is used to perform click operation on any web element.

```
driver.findElement(By.id("btnK")).click();
```

5. Navigating backward in browser history

```
driver.navigate().back();
```

6. Navigating forward in browser history

```
driver.navigate().forward();
```

7. Refresh/ Reload a web page

```
driver.navigate().refresh();
```

8. Closing Browser

```
driver.close();
```

9. Closing Browser and other all other windows associated with the driver

```
driver.quit();
```

10. Moving between Windows

```
driver.switchTo().window("windowName");
```

11. Moving between Frames

```
driver.switchTo().frame("frameName");
```

12. Drag and Drop

Drag and Drop operation is performed using the Action class.

```
WebElement element = driver.findElement(By.name("source"));

WebElement target = driver.findElement(By.name("target"));

(new Actions(driver)).dragAndDrop(element, target).perform();
```

Selenium WebDriver - Browser Commands

Given are some of the most commonly used Browser commands for Selenium WebDriver

1. Get Command

Method:

1. get(String arg0) : **void**

In WebDriver, this method loads a new web page in the existing browser window. It accepts *String* as a parameter and returns *void*.

The respective command to load a new web page can be written as:

```
driver.get(URL);

  // Or can be written as

String URL = "URL";

driver.get(URL);
```

2. Get Title Command

Method:

1. getTitle(): String

In WebDriver, this method fetches the title of the current web page. It accepts no parameter and returns a String.

The respective command to fetch the title of the current page can be written as:

```
driver.getTitle();
// Or can be written as
String Title = driver.getTitle();
```

3. Get Current URL Command

Method:

1. getCurrentUrl(): String

In WebDriver, this method fetches the string representing the Current URL of the current web page. It accepts nothing as parameter and returns a String value.

Programs :

1.Screenshot

```
public class screenshot{
        public static void main(String[] args) throws IOException{
                System.setproperty("webdriver.chrome.driver","//path");
                Webdriver driver=new Chromedriver();
                driver.get("//path of site");
                File screenshot=((TakeScreenShot)driver).getScreenshotAs(OutputType.File);
                FileHandler.copy(screenshot,new File("//new file path"));
        }
}
```

2.Getting Title from webpage

```
public class title{
        public static void main(String[] args){
                System.setproperty("webdriver.chrome.driver","//path");
                Webdriver driver=new Chromedriver();
                driver.get("//path of site");
                System.out.println("Title is" +driver.getTitle());
                String expected="gggg";
                String actual=driver.getTitle();
                if(expected.contentEquals(actual))
                {
                        System.out.println("test case passed");
                }
                else
                {
                        System.out.println("test case failed");
                }
        }
}
```

3.Count the number of links in webpage

```
public class count{
public static void main(String[] args){
                System.setproperty(“webdriver.chrome.driver”,”//path”);
                Webdriver driver=new Chromedriver();
                String homepage=”//sitepath”;
                driver.get(homepage);

        System.out.println(“total link count “ +driver.FindElements(By.tagName(“a”)).size());
        WebElement head=driver.FindElement(By.id(“//id header”));
      System.out.println(“total link in head “ +driver.FindElements(By.tagName(“a”)).size());
        WebElement foot=driver.FindElement(By.id(“//id footer”));
     System.out.println(“total link in footer“ +driver.FindElements(By.tagName(“a”)).size());
   }
}
```

4.Multiple windows

```
public class count{
public static void main(String[] args){
                System.setproperty(“webdriver.chrome.driver”,”//path”);
                Webdriver driver=new Chromedriver();
                driver.get(“//pathsite”);
                driver.findElement(By.linkText("Forgot your password?")).click();
                Set<String> a=driver.getWindowHandles();
                Iterator<String> it=a.iterator();
                while(it.hasNext())
                {
                        String childwindow=it.next();
```

```
                    driver.switchTo().window(childwindow);
                }
            }
        }
```

5.List of Broken links

```
public class broken{
public static void main(String[] args){
                System.setproperty("webdriver.chrome.driver","//path");
                Webdriver driver=new Chromedriver();
                String homepage="//sitepath";
                String url=null;
                HttpsURLConnection huc=null;
                int respcode=200;
                driver.manage().window().maximise();
                driver.get(homepage);
                java.util.List<WebElement> links=driver.findElements(By.tagName("a"));
                Iterator<WebElement> it=links.iterator();
                while(it.hasNext())
                {
                    url=it.next().getAttribute("href");
                    System.out.println(url);
                    if(url==null || url.isEmpty())
                    {
                    System.out.println("url is not configured or its empty");
                    continue;
                    }
                    if(!url.startsWith(homepage))
                    {
                    System.out.println("url belongs to another domain");
                    continue;
                    }
                try{
```

```
            huc=(HttpsURLConnection)(new URL(url).openConnection());
            huc.setRequestmethod(“HEAD”);
            huc.connect();
            respcode=huc.getResponseCode();
            if(respcode>=400)
            {
                System.out.println(url+ “is a broken link”);
            }
            else
            {
                system.out.println(url+ “is a valid link”);
            }
        }catch(malFormedURLException e){
            e.printStackTrace();
        }
        catch(IOException e)
        {
            e.printstackTrace();
        }
    }
}
```

6.Switching Between Pop-up Windows

```
public class myclass {

    public static void main(String[] args) {
              System.setProperty("webdriver.chrome.driver","//path");
              WebDriver driver = new ChromeDriver();
               String alertMessage = "";

        driver.get("http://jsbin.com/usidix/1");
        driver.findElement(By.cssSelector("input[value=\"Go!\"]")).click();
        alertMessage = driver.switchTo().alert().getText();
        driver.switchTo().alert().accept();

        System.out.println(alertMessage);
        driver.quit();

    }
}
```

7.CheckBox & Radio Button

```
public class Form {
    public static void main(String[] args) {


            // declaration and instantiation of objects/variables
        System.setProperty("webdriver.chrome.driver","G:\\chromedriver.exe");

        WebDriver driver = new ChromeDriver();

        driver.get("http://demo.guru99.com/test/radio.html");
        WebElement radio1 = driver.findElement(By.id("vfb-7-1"));

        WebElement radio2 = driver.findElement(By.id("vfb-7-2"));



        //Radio Button 1 is selected
        radio1.click();
        System.out.println("Radio Button Option 1 Selected");

        //Radio Button 1 is deselected and Radio Button 2 is selected
        radio2.click();
        System.out.println("Radio Button Option 2 Selected");

        // Selecting CheckBox
        WebElement option1 = driver.findElement(By.id("vfb-6-0"));



        // This will Toggle the Checkbox
        option1.click();

        // Check whether the Checkbox is toggled on
        if (option1.isSelected()) {
            System.out.println("Checkbox is Toggled On");

        } else {
            System.out.println("Checkbox is Toggled Off");
        }




        //Selecting Checkbox and using isSelected Method
        driver.get("http://demo.guru99.com/test/facebook.html");

        WebElement chkFBPersist = driver.findElement(By.id("persist_box"));

        for (int i=0; i<2; i++) {

            chkFBPersist.click ();
            System.out.println("Facebook Persists Checkbox Status is -
"+chkFBPersist.isSelected());
        }
                //driver.close();
```

```
    }
}
```