

# Software Testing

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Friday, November 2, 2012

## Difference between error, fault, bug, failure and defect

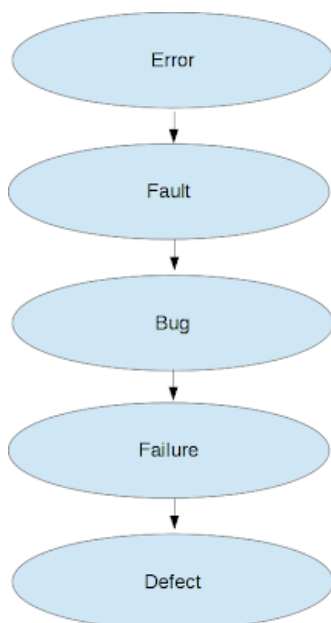


Figure 1

### What is an error?

Error is deviation from actual and expected value. It represents mistake made by people.

### What is a fault?

Fault is incorrect step, process or data definition in a computer program which causes the program to behave in an unintended or unanticipated manner. It is the result of the error.

### What is a bug?

Bug is a fault in the program which causes the program to behave in an unintended or unanticipated manner.

It is an evidence of fault in the program.

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[Kunti Shah](#)

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## What is a failure?

Failure is the inability of a system or a component to perform its required functions within specified performance requirements.

Failure occurs when fault executes.

## What is a defect?

A defect is an error in coding or logic that causes a program to malfunction or to produce incorrect/unexpected results.

A defect is said to be detected when a failure is observed.

So I wrote a C program as mentioned below:

Add two numbers program

### Example 1:

As mentioned this program is required to add two numbers.

```

1    #include<stdio.h>
2
3    int main ()
4    {
5    int value1, value2, ans;
6
7    value1 = 5;
8    value2 = 3;
9
10   ans = value1 - value2;
11
12   printf("The addition of 5 + 3 = %d.", ans);
13
14   return 0;
15   }
```

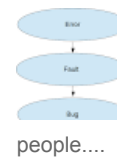


Figure 1 What is an error?  
Error is deviation from actual and expected value. It represents mistake made by people....

### Severity and Priority of Bugs

Severity of Bugs: Severity of the bugs is classified depending upon the impact of error on the application / system. The severity class...



### Life Cycle of Testing

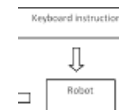
Earlier, Testing was performed by developers themselves. After the developers implemented and tested the software, it ...

### Objectives of Software Testing

To check the software for deviation from the functional requirements. Software Testing is performed NOT to...

### Module Testing / Unit Testing Concept

Please refer to Move the Robot figure and explanation here - <http://softwaretestingbykunti.blogspot.com/2013/10/move-robot-program.html> ...



### Move the Robot Program

Fig 1 Move the Robot 1  
2 3 4 1 Robot 2 ...

### Why should Testing be performed?

Software Testing should be performed to remove errors. Earlier software resided only in computers and laptops but now ...

When you compile and run this program you see the printed statement as below:

### **The addition of 5 + 3 = 2.**

So after compiling and running this program we realize the program has failed to do what it was supposed to do.

The program was supposed to add two numbers but it certainly did not add 5 and 3. 5 + 3 should be 8, but the result is 2. There could be various reasons as to why the program displays the answer 2 instead of 8. For now we have detected a *failure*.

As the failure has been detected a *defect* can be raised.

Now lets go back to the program and analyze what was the fault in the program.

```
1    #include<stdio.h>
2
3    int main ()
4    {
5    int value1, value2, ans;
6
7    value1 = 5;
8    value2 = 3;
9
10   ans = value1 - value2; // ----> Bug
11
12   printf("The addition of 5 + 3 = %d.", ans);
13
14   return 0;
15   }
```

We notice at line number 10, there is a '-' sign present instead of '+' sign. So the fault in the program is the '-' sign. Line 10 has the fault which caused the program to deviate from the functionality.

Error is the mistake I made by typing '-' instead of '+' sign. We have observed failure in correct execution of the program. And in this case we can also say we have found the bug.

A tester does not necessarily have access to the code and may be just testing the functionality of the program. In that case the tester will realize the output is faulty and will raise a defect. Due to the observed wrong result it is known of the fact that the program has an error which resulted in the fault in the program and due to which the program failed to give the correct result. But the tester may not know exactly what is causing the error.

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Posted by Kunti Shah at [12:33 PM](#)



Labels: [Bug](#), [Defect](#), [Error](#), [Failure](#), [Fault](#)

### 39 comments:



**hafbloodyhaf** May 17, 2013 at 12:34 PM

good explanation ! thanks mate

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**KShah S** August 14, 2013 at 9:36 AM

Thanks for your comment! Please let me know if you need any particular examples / concept explained. I am working on some concepts which will come up soon! Watch this space for more!

---

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**chitransh jain** May 20, 2013 at 12:41 PM

awsmmm...

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**KShah S** August 14, 2013 at 9:35 AM

Thanks Chitransh for your comment! Please let me know if you need any particular examples / concept explained. I am working on some concepts which will come up soon! Watch this space for more!

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**Jansher Rahman** June 20, 2013 at 12:09 PM

Very good explanation.thank you

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**KShah S** August 14, 2013 at 9:36 AM

Thanks Jansher for your comment! Please let me know if you need any particular examples / concept explained. I am working on some concepts which will come up soon! Watch this space for more!



**AZMATH** December 7, 2014 at 12:44 AM

Can you Explain Different Fault Diagnosis Processes according to Modern Technology

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**Rajkumar Pawar** July 23, 2013 at 2:29 AM

Simple best example in very clear way ...thanks a lot

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[Replies](#)



**KShah S** August 14, 2013 at 9:36 AM

Thanks Rajkumar for your comment! Please let me know if you need any particular examples / concept explained. I am working on some concepts which will come up soon! Watch this space for more!

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**mary** August 23, 2013 at 2:12 AM

it is very cleared answer

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**KShah S** August 23, 2013 at 8:39 AM

Thanks Mary for your comment! Please let me know if you need any particular examples / concept explained. I am working on some concepts which will come up soon! Watch this space for more!

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**Anonymous** September 11, 2013 at 4:47 AM

The explanation is really good. I would like an example of Top down and Bottom up approach of testing.

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**KShah S** October 24, 2013 at 9:16 AM

Thanks for your comment! I am working on your Top down and Bottom up approach of testing! Sorry for the delay!



**KShah S** October 25, 2013 at 11:16 AM

I have Module Testing / Unit testing post uploaded <http://softwaretestingbykunti.blogspot.com/2013/10/module-testing-unit-testing.html>  
This would be a suggested read before Top down and Bottom up approach of testing. I am on working on the latter meanwhile!

---

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**Debashree Bose** October 24, 2013 at 1:20 AM

Thanks a lot, the explanation is awesome.

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[Replies](#)



**KShah S** October 24, 2013 at 9:16 AM

Thanks for your comment! Please let me know if you need any particular examples / concept explained. I am working on some concepts which will come up soon! Watch this space for more!

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**Anonymous** October 24, 2013 at 9:11 AM

Thanks bro gud explanation...

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[Replies](#)



**KShah S** October 24, 2013 at 9:16 AM

Thanks for your comment! Please let me know if you need any particular examples / concept explained. I am working on some concepts which will come up soon! Watch this space for more!

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**shivani soni** April 10, 2014 at 2:17 PM

very nicely explained!! thanksss :)

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**KShah S** April 11, 2014 at 9:04 AM

Thanks for your comment! Please let me know if you need any particular examples / concept explained. I am working on some concepts which will come up soon! Watch this space for more!

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**Anonymous** September 12, 2014 at 5:27 AM

Hi,  
kindly explain V model and Agile model with example

Thanks and regards

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**Anonymous** January 7, 2015 at 2:28 AM

Really awesome..

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**K Sha** January 29, 2015 at 6:40 AM

Thanks for your comment! Please let me know if you need any particular examples / concept explained. I am working on some concepts which will come up soon! Watch this space for more!

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**Anonymous** February 17, 2015 at 5:28 AM

Hai, I need some examples for top down approach and bottom up approach in integration testing

[Reply](#)

**Anonymous** May 19, 2015 at 7:02 AM

EXcellent explanation !!!

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**K Sha** July 23, 2015 at 2:34 PM

Thanks for your comment! Please let me know if you need any particular examples / concept explained. I am working on some concepts which will come up soon! Watch this space for more!

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**Anonymous** July 19, 2015 at 1:46 AM

I'm really thankful to you it helped me a lot :)

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**K Sha** July 23, 2015 at 2:33 PM

Thanks for your comment! Please let me know if you need any particular examples / concept explained. I am working on some concepts which will come up soon! Watch this space for more!

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**Mirza Anas** September 2, 2015 at 12:39 AM

Hey,

Best Explanation !!

But i think Bug and Error are same thing

Mean

ans = value1 - value2 ;

this is called Error and Bug also

Fault:

Mean if a program/App launched in market and after some time due to some reason this app not show require answer so this is called Fault in this program .

Am i right in above concept ???

Reply

Replies



**K Sha** September 2, 2015 at 7:16 AM

Mirza Anas,

Thanks for dropping the comment.

```
ans=value1-value2;
```

Error is the mistake I made by typing '-' instead of '+' sign. We have observed failure in correct execution of the program. And in this case we can also say we have found the bug.

Yes, you are right that Bug and Error mean the same thing.

The difference is,

```
value1 = 5;
value2 = 3;
```

ans should be 8.

Tester only knows that the answer of the program should be 8.  
He/she does not know why the answer is 2.  
Tester checks that ans is not equal to 8 and reports/files a bug report.

Developer will check the bug report and then check the program.  
Developer will try to find why  $5+3 = 2$  according to the program.  
Developer should find that he/she made an error of typing minus sign instead of plus sign. Developer found the bug in the program. YAY!  
Developer will change the minus sign to plus sign.  
Developer will now say that the bug is fixed.

I hope this helps.

The program could also be  
`ans=value1 - value2 + value2 ;`

In this case  
`value1 = 5;`  
`value2= 3;`  
answer should be 8 because the program is to add two numbers.  
But the program when executed gives the `ans=5;`

Tester only knows that the answer of the program should be 8.  
He/she does not know why the answer is 5.  
Tester checks that ans is not equal to 8 and reports/files a bug report.

Developer will check the bug report and then check the program.  
Developer will try to find why  $5+3 = 5$  according to the program.  
Developer should find that he/she made an error of typing  
`ans= value1 - value2 +value2;` instead `ans = value1 + value2;`. Developer found the bug in the program. YAY!  
Developer will change the equation. Now `ans = value1 + value2;`  
Developer will now say that the bug is fixed.



**K Sha** September 2, 2015 at 7:35 AM

Your Question:

Fault:

Mean if a program/App launched in market and after some time due to some reason this app not show require answer so this is called Fault in this program .

Answer:



Yes Fault could mean that too.

At any time the program does not behave properly due to incorrect step, process or data definition in the computer program, we say that fault has occurred.

Example.

I have to write a program that add any two numbers that are integers or decimals.

And I write the program as below:

```
1 #include
2
3 int main ()
4 { float value1, value2;
5 int ans;
6
7 value1 = 5;
8 value2 = 3;
9
10 ans = value1 - value2;
11
12 printf("The addition of 5 + 3 = %d.", ans);
13
14 return 0;
15 }
```

This program when tested only with integer numbers will give the correct result.

Although when we add float numbers with this program, the ans will be incorrect and this is the FAULT in the program.

The reason there is a fault in the program because the developer made error of keeping ans as integer instead of changing it to float.

This will give incorrect value of ans.

When two float numbers are added the result should be float and not integer.

Suppose I tested the program only with integers and thought it was working properly.

I send the program for release / production.

The program works fine when end users add two integers.

The program will show wrong result when end users add one float and one integer OR two float numbers.

Here the error occurred because ans was defined as integer instead of float.

---

#### Reply



**Unknown** April 25, 2016 at 11:21 PM

worthy words . thanks. -megaya

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**Anshul chaurasia** June 24, 2016 at 4:24 PM

It's a very good explanation

Thank you very much

[Reply](#)



**pradeep kharat** August 8, 2016 at 9:10 AM

Thank you so much Mam.

[Reply](#)

**Anonymous** September 20, 2016 at 10:47 PM

*This comment has been removed by a blog administrator.*

[Reply](#)**Anonymous** September 20, 2016 at 11:14 PM

Thanks for this nice article

[Reply](#)**Anonymous** August 10, 2017 at 6:32 PM

Thanks for such a clear explanation. I used to experience this problem a lot with my previous software, but thanks to [dynamics ax partners](#) I switched to Microsoft Dynamics. It's working great so far!

[Reply](#)**Sakthi k** June 5, 2018 at 5:08 AM

Thanks for this nice blog. [Software Testing Training in Chennai](#)

[Reply](#)**Nicole Bolton** June 19, 2018 at 9:51 AM

Thanks for sharing the valuable information here. So i think i got some useful information with this content. Thank you and please keep update like this informative details.

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