

How to Fix a Bug

Read the Error Message

If the bug is producing an error message, read it carefully. Sometimes they can be unhelpful, but generally they can give you a clue as to what the issue might be, or at least what line number to start looking from. It can also be really useful to put the error message into Google and you will often find that someone else has experienced this error and has found a solution.

Beware of Side-Effects

Fixing a bug should be done very carefully, if the fix is done poorly it can introduce other errors into the program, and do more harm than good, so it's important to be careful when fixing bugs. American software engineer Tom Van Vleck outlined three simple questions that we should ask ourselves before making a fix:

1. *Is this bug (or a similar bug) likely to appear in another part of the code?*
In many cases a programmer will use the same type of logic throughout the code, so if an error is found in one part of the program, it may be worth reflecting on whether or not there are other parts of the code that has similar functionality.
2. *What new error might be introduced into the program when fixing the error?*
Before the error is fixed, it is a good idea to explore the design of the program, to check if the location where the bug was found is dependent on other parts of the program, in terms of sharing data structures or program logic. If there is a dependency (a coupling), then it is important to carefully check what the consequences could be of any changes made.
3. *What can be done to prevent this same bug from happening again?*
This is the first step in creating a good Software Quality Assurance Process going forward. If there was a problem in the development process that caused the error to occur, fixing that issue with the process will prevent similar errors from occurring in the future.

Other Terms for Bugs

Depending on who is discussing bugs, they may use different terms to describe them, so for example, someone in IT Sales might call them *features*, whereas a tester might call them *issues*. Here are some other terms for bugs:

Defects	Faults	Problems	Incidents
Anomalies	Inconsistencies	Variances	Failures
Mistakes	Exceptions	Errors	Side Effects

This is a small sampling of the range of terms used for bugs.

#PythonMonday © Damian Gordon