Testing

Bug

Error in a program.

Testing

Process of analyzing, running program, looking for bugs.

Test case

A set of input values, together with the expected output.

Debugging

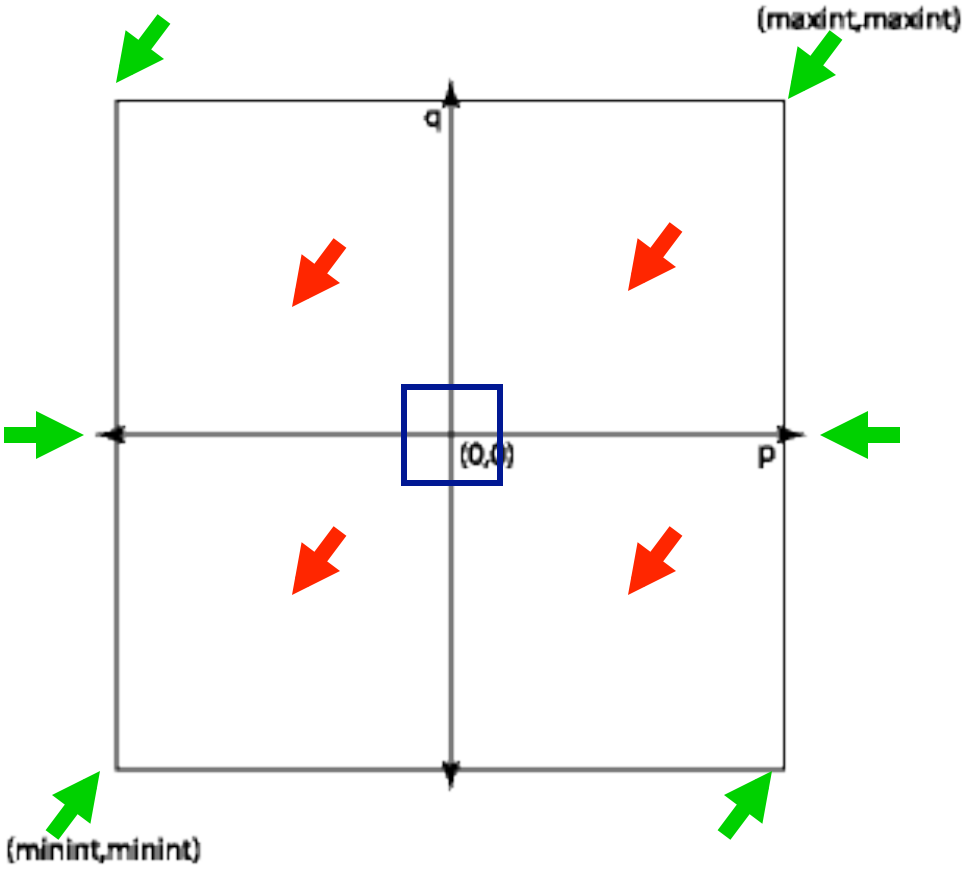
Process of looking for what caused a bug and fixing it.

Test cases

Write a method specification *before* writing the method body. Some advocate writing test cases before writing the method body.

Test early and often. The sooner you test a method, the sooner you will find and fix bugs.

Think about the entire set of input, and do not forget to test interesting regions of input space.


(maxint,maxint)
q
(0,0)
p
(minint,minint)

Principles (Cont.)

Develop test cases that provide test *coverage*. Every single part of the program needs to be executed at least once.

Test only one thing at a time. Otherwise, you will have a hard time figuring out where the bugs come from.

Test each method thoroughly as it is completed. It reduces the area of the program to be investigated.

Verify the documentation. Make sure it answers every questions.

Approaches to creating test cases

Exhaustive Testing

- Test a program on all possible inputs.
- Generally infeasible for most programs

Blackbox Testing

- One looks only at he specification of the program.
- The program is a black box.

Approaches to creating test cases (cont.)

Glassbox Testing

- One looks at the program itself.
- Structural testing.

Testing a class

- Declare variable(s).
- Create instances of the class and assign them to the variables.
- Check that the constructor of the class works properly.

```
System.out.println(x.toString());
```