

Lesson 5 FAQs

Q: Is design really that important to do before writing a program?

A: Design is incredibly important. For small programs like the ones we're working on in this course, it may seem irrelevant. But on real-life projects, programmers spend as much as 25% to 40% of the total project time on design before writing a single line of code. Writing the classes and programs takes more like 15% to 25% of the total, and the rest is testing and implementation.

The reason is that the sooner a programmer finds problems, the cheaper it is to solve them. IBM, which has probably written more software than any other company, has done studies that suggest it can cost more than six times as much to solve a problem during coding than it does during design. The same study found that it can cost 15 times as much during testing, and 100 times after that.

One of the most glaring examples of bad design happened back in 1997 when the government admitted that a computer modernization project that it spent \$4 billion on (yes, billion with a *b*) was a failure.

As you progress in your programming, you'll find that the adage "A stitch in time saves nine" is true. Be sure to do your design first!

Q: How can I remember the rules about priority of operation? When I have a complicated calculation, I can't remember whether Java multiplies or divides or adds first.

A: Mathematicians use the abbreviation PEMDAS to help them remember the order of operations.

- P** Do calculations in parentheses first.
- Compute exponents such as 3^2 and 5^2 next.
- E** We didn't encounter these in the lesson, but some are in the assignment.
- M** Multiply.
- D** Divide.
- A** Add.
- S** Subtract.

Schoolchildren often have trouble remembering PEMDAS, so they use this sentence instead: "Please Excuse My Dear Aunt Sally."

