



## Stuff you don't need to know about language levels

Programming languages have different levels, depending on how much they resemble human languages. Programming languages that use common words and are relatively easy for most folks to read and study are called *high-level* languages. The opposite of those are *low-level* languages, which are not easy to read or study.

High-level languages include the popular BASIC programming language as well as other languages that just aren't that popular any more. BASIC reads almost like English, and all its commands and instructions are English words — or at least English words missing a few vowels or severely disobeying the laws of spelling.

The lowest of the low-level programming languages is machine language. That language is the actual primitive grunts and groans of the microprocessor itself. Machine language consists of numbers and codes that the microprocessor understands and executes. Therefore, no one really writes programs in machine language; rather, they use assembly language, which is one step above the low-level machine

language because the grunts and groans are spelled out rather than entered as raw numbers.

Why would anyone use a low-level language when high-level languages exist? Speed! Programs written in low-level languages run as fast as the computer can run them, often many times faster than their high-level counterparts. Plus, the size of the program is smaller. A program written in Visual Basic may be 34K in size, but the same program written in assembly language may be 896 bytes long. On the other hand, the time it takes to develop an assembly language program is much longer than it would take to write the same program in a higher-level language. It's a trade-off.

The C programming language is considered a mid-level language. It has parts that are low-level grunting and squawking, and also many high-level parts that read like any sentence in a Michael Crichton novel, but with more character development. In C, you get the best of the high-level programming languages and the speed of development they offer, and you also get the compact program size and speed of a low-level language. That's why C is so bitchen.

No, I'm not being flip. C was developed at AT&T Bell Labs in the early 1970s. At the time, Bell Labs had a programming language named B — B for Bell. The next language they created was C — one up on B.

- ✔ C is the offspring of both the B programming language and a language named BCPL, which stood for Basic Combined Programming Language. But you have to admit that the B story is cute enough by itself.
- ✔ You would think that the next, better version of C would be called the D language. But, no; it's named C++, for reasons that become apparent in Chapter 16.
- ✔ C is considered a *mid-level language*. See the nearby sidebar, “Stuff you don't need to know about language levels,” for the boring details.