1.7 Programming Languages

Figure 1.6 provides brief comments on several popular programming languages. In the next section, we introduce Java.

Programming language	Description
Ada	Ada, based on Pascal, was developed under the sponsorship of the U.S. Department of Defense (DOD) during the 1970s and early 1980s. The DOD wanted a single language that would fill most of its needs. The Pascal-based language was named after Lady Ada Lovelace, daughter of the poet Lord Byron. She's credited with writing the world's first computer program in the early 1800s (for the Analytical Engine mechanical computing device designed by Charles Babbage). Ada also supports object-oriented programming.
Basic	Basic was developed in the 1960s at Dartmouth College to familiarize novices with programming techniques. Many of its latest versions are object oriented.
C	C was developed in the early 1970s by Dennis Ritchie at Bell Laboratories. It initially became widely known as the UNIX operating system's development language. Today, most code for general-purpose operating systems is written in C or C++.
C++	C++, which is based on C, was developed by Bjarne Stroustrup in the early 1980s at Bell Laboratories. C++ provides several features that "spruce up" the C language, but more important, it provides capabilities for object-oriented programming.
	Microsoft's three primary object-oriented programming languages are C# (based on C++ and Java), Visual C++

C#	(based on C++) and Visual Basic (based on the original Basic). C# was developed to integrate the web into computer applications, and is now widely used to develop enterprise applications and for mobile application development.
COBOL	COBOL (COmmon Business Oriented Language) was developed in the late 1950s by computer manufacturers, the U.S. government and industrial computer users, based on a language developed by Grace Hopper, a career U.S. Navy officer and computer scientist. (She was posthumously awarded the Presidential Medal of Freedom in November of 2016.) COBOL is still widely used for commercial applications that require precise and efficient manipulation of large amounts of data. Its latest version supports object-oriented programming.
Fortran	Fortran (FORmula TRANslator) was developed by IBM Corporation in the mid-1950s to be used for scientific and engineering applications that require complex mathematical computations. It's still widely used, and its latest versions support object-oriented programming.
JavaScript	JavaScript is the most widely used scripting language. It's primarily used to add programmability to web pages—for example, animations and interactivity with the user. All major web browsers support it.
Objective-C	Objective-C is an object-oriented language based on C. It was developed in the early 1980s and later acquired by NeXT, which in turn was acquired by Apple. It became the key programming language for the OS X operating system and all iOS-powered devices (such as iPods, iPhones and iPads).
Pascal	Research in the 1960s resulted in *structured programming*—a disciplined approach to writing programs that are clearer, easier to test and debug and easier to modify than programs produced with previous techniques. The Pascal language, developed by Professor Niklaus Wirth in 1971, grew out of this research. It was popular for teaching structured programming for several decades.
PHP	PHP is an object-oriented, *open-source* "scripting" language supported by a community of developers and used by numerous websites. PHP is platform independent—implementations exist for all major UNIX, Linux, Mac and Windows operating systems.

Python	Python, another object-oriented scripting language, was released publicly in 1991. Developed by Guido van Rossum of the National Research Institute for Mathematics and Computer Science in Amsterdam, Python draws heavily from Modula-3—a systems programming language. Python is "extensible"—it can be extended through classes and programming interfaces.
Ruby on Rails	Ruby—created in the mid-1990s by Yukihiro Matsumoto—is an open-source, object-oriented programming language with a simple syntax that's similar to Python. Ruby on Rails combines the scripting language Ruby with the Rails web-application framework developed by the company 37Signals. Their book, *Getting Real* (free at `http://gettingreal.37signals.com/toc.php`), is a must-read for web developers. Many Ruby on Rails developers have reported productivity gains over other languages when developing database-intensive web applications.
Scala	Scala (`http://www.scala-lang.org/what-is-scala.html`)—short for "scalable language"—was designed by Martin Odersky, a professor at École Polytechnique Fédérale de Lausanne (EPFL) in Switzerland. Released in 2003, Scala uses both the object-oriented programming and functional programming paradigms and is designed to integrate with Java. Programming in Scala can reduce the amount of code in your applications significantly.
Swift	Swift, which was introduced in 2014, is Apple's programming language of the future for developing iOS and OS X applications (apps). Swift is a contemporary language that includes popular programming-language features from languages such as Objective-C, Java, C#, Ruby, Python and others. According to the Tiobe Index, Swift has already become one of the most popular programming languages. Swift is now *open source*, so it can be used on non-Apple platforms as well.
Visual Basic	Microsoft's Visual Basic language was introduced in the early 1990s to simplify the development of Microsoft Windows applications. Its features are comparable to those of C#.

Fig. 1.5

Some other programming languages.