

Just about anything could have a computer in it—a phone, a car, a watch, a video game console, an exercise machine, a medical device, industrial equipment, a greeting card, or a robot. Computer programming, or *coding*, is how we tell a computer to perform a task, and understanding how to code puts the power of computers at your fingertips.

Computer programs—also called *applications*, or *apps*—tell computers what to do. A web app can tell the computer how to keep track of your favorite music; a game app can tell the computer how to display an epic battlefield with realistic graphics; a simple app can tell the computer to draw a beautiful spiral like the hexagon in Figure 1-1.

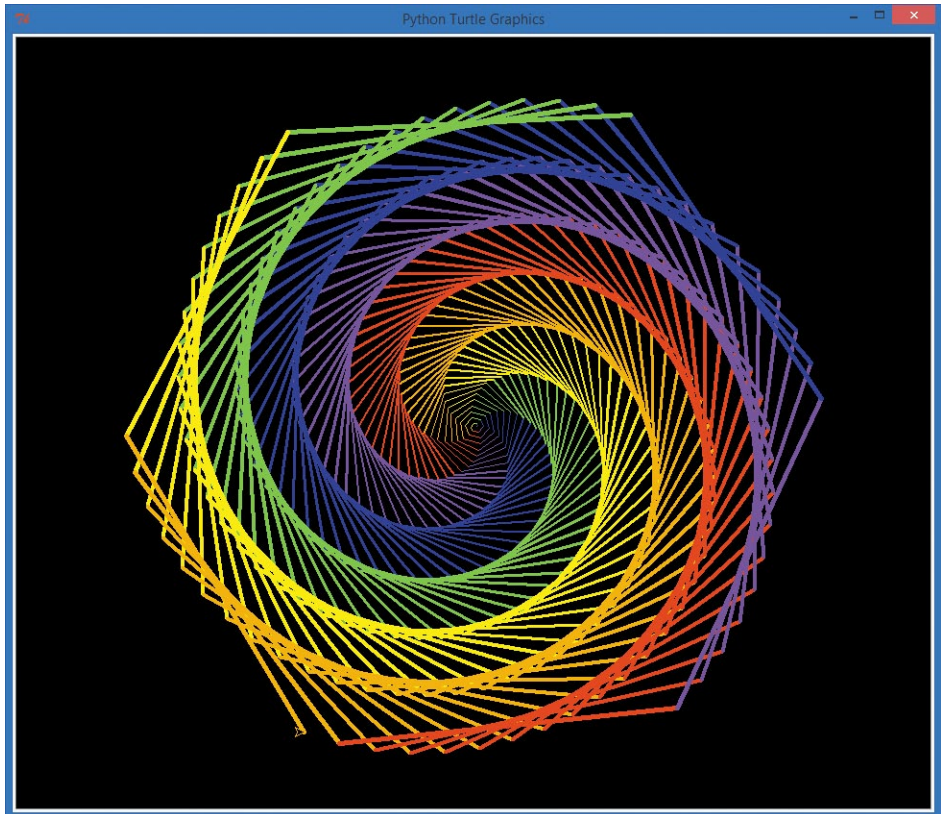


Figure 1-1: A colorful spiral graphic

Some apps are composed of thousands of lines of code, while others may be just a few lines long, like the program *NiceHexSpiral.py* in Figure 1-2.

```
*NiceHexSpiral.py - C:/Python33/NiceHexSpiral.py
File Edit Format Run Options Windows Help
#NiceHexSpiral.py
import turtle
colors=['red', 'purple', 'blue',
        'green', 'yellow', 'orange']
t=turtle.Pen()
turtle.bgcolor('black')
for x in range(360):
    t.pencolor(colors[x%6])
    t.width(x/100+1)
    t.forward(x)
    t.left(59)
Ln: 11 Col: 14
```

Figure 1-2: NiceHexSpiral.py, a short Python program that draws the spiral in Figure 1-1

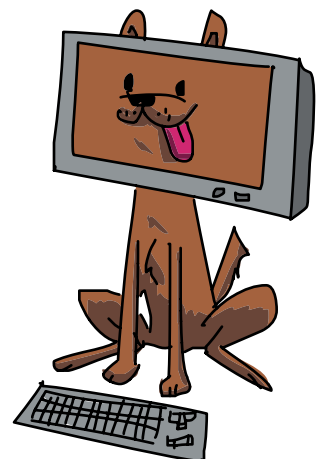
This short program draws the colorful spiral shown in Figure 1-1. I wanted a pretty picture to use as an example in this book, so I decided to solve that problem using a computer program. First I sketched out an idea, and then I started coding.

In this chapter, we'll download, install, and learn to use the programs that will help us write code to build any kind of app you can imagine.

## GETTING STARTED WITH PYTHON

To begin coding, we have to speak the computer's language. Computers need step-by-step instructions, and they can only understand certain languages. Just like a person from Russia might not be able to understand English, computers only understand languages made for them.

Computer code is written in programming languages like Python, C++, Ruby, or JavaScript. These languages allow us to “talk” to our computer and give it commands. Think about when you teach a dog to do tricks—when you give the “sit” command, he sits; when you say “speak,” he barks. The dog understands those simple commands, but not much else you say.



Likewise, computers have their own limitations, but they can do whatever you tell them to do in their language. The language we'll use in this book is *Python*, a simple, powerful programming language. Python is taught in introductory computer science courses in high school and college, and it's used to run some of the most powerful apps in the world, including Gmail, Google Maps, and YouTube.

To get you started using Python on your computer, we'll go through these three steps together:

1. Download Python.
2. Install Python on your computer.
3. Test Python with a simple program or two.



## 1. DOWNLOAD PYTHON

Python is free and easy to get from the Python website, shown in Figure 1-3.

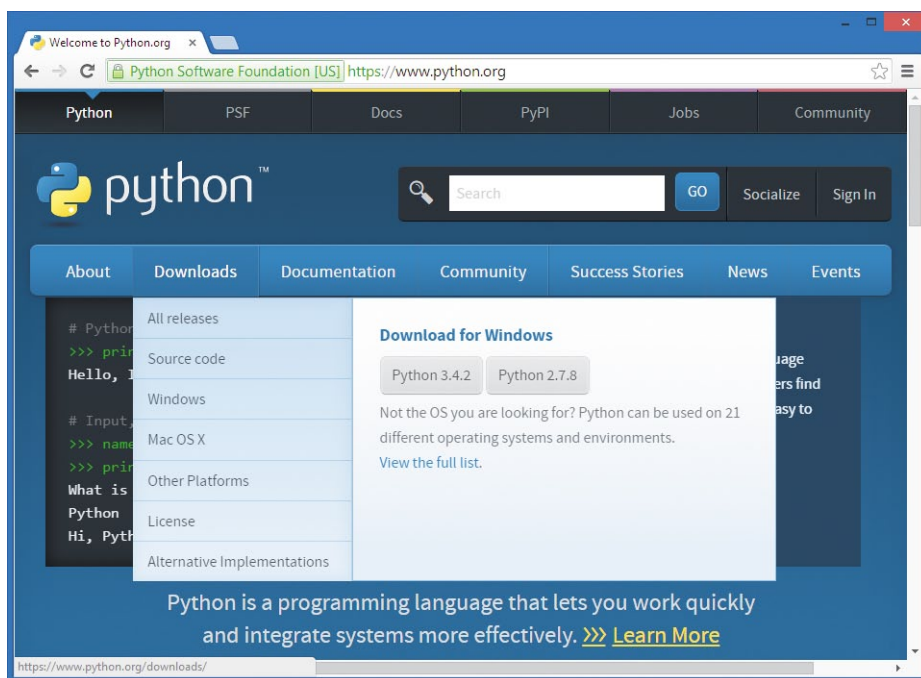


Figure 1-3: The Python website makes it easy to download Python.

In your web browser, go to <https://www.python.org/>. Hover your mouse over the **Downloads** menu button near the top and click the button that begins with **Python 3**.

## 2. INSTALL PYTHON

Find the file you just downloaded (it's probably in your *Downloads* folder) and double-click it to run and install Python and the IDLE editor. IDLE is the program we'll use to type and run our Python programs. For detailed installation instructions, see Appendix A.

## 3. TEST PYTHON WITH A PROGRAM

In your Start menu or *Applications* folder, find the IDLE program and run it. You'll see a text-based command window like the one shown in Figure 1-4. This is called the Python shell. A *shell* is a window or screen that lets the user enter commands or lines of code.

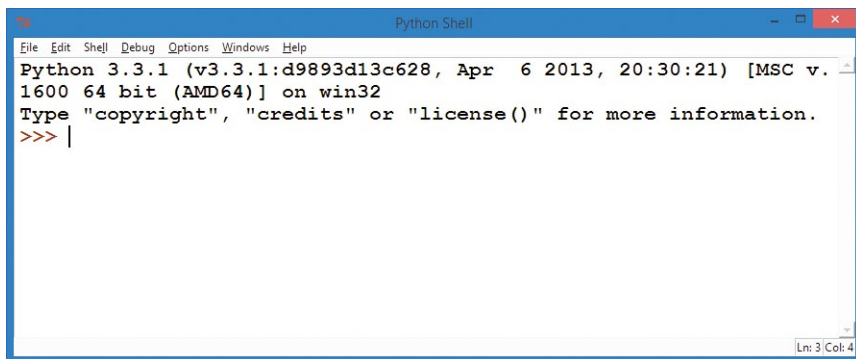


Figure 1-4: The IDLE Python shell—our command center for learning Python

The `>>>` is called a *prompt*, and it means that the computer is ready to accept your first command. The computer is asking you to tell it what to do. Type

---

```
print("Hello, world!")
```

---

and press ENTER or RETURN on your keyboard. You should see the Python shell respond by printing the text in quotes that you entered inside the parentheses: Hello, world!. That's it—you've written your first program!