Special Topic 4.4

Escape Sequences

Suppose you want to display a string containing quotation marks, such as

```
Hello, "World"!
```

You can't use

```
System.out.println("Hello, "World"!");
```

As soon as the compiler reads `"Hello, "`, it thinks the string is finished, and then it gets all confused about `World` followed by two quotation marks. A human would probably realize that the second and third quotation marks were supposed to be part of the string, but a compiler has a one-track mind. If a simple analysis of the input doesn't make sense to it, it just refuses to go on, and reports an error. Well, how do you then display quotation marks on the screen? You precede the quotation marks inside the string with a *backslash* character. Inside a string, the sequence `\"` denotes a literal quote, not the end of a string. The correct display statement is, therefore

```
System.out.println("Hello, \"World\"!");
```

The backslash character is used as an *escape* character; the character sequence `\"` is called an escape sequence. The backslash does not denote itself; instead, it is used to encode other characters that would otherwise be difficult to include in a string.

Now, what do you do if you actually want to print a backslash (for example, to specify a Windows file name)? You must enter two `\\` in a row, like this:

```
System.out.println("The secret message is in C:\\Temp\\Secret.txt");
```

This statement prints

```
The secret message is in C:\Temp\Secret.txt
```

Another escape sequence occasionally used is `\n`, which denotes a *newline* or line feed character. Printing a newline character causes the start of a new line on the display. For example, the statement

```
System.out.print("*\n**\n***\n");
```

prints the characters

```
*
**
***
```

on three separate lines. Of course, you could have achieved the same effect with three separate calls to `println`.

Finally, escape sequences are useful for including international characters in a string. For example, suppose you want to print “All the way to San José!”, with an accented letter (é). If you use a U.S. keyboard, you may not have a key to generate that letter. Java uses the *Unicode* encoding scheme to denote international characters. For example, the é character has Unicode encoding `00E9`. You can include that character inside a string by writing `\u`, followed by its Unicode encoding:

```
System.out.println("All the way to San Jos\u00E9!");
```

You can look up the codes for the U.S. English and Western European characters in Appendix A, and codes for thousands of characters at `www.unicode.org`.