13.5 Using the C String Library

Some programming languages provide operators that can copy strings, compare strings, concatenate strings, select substrings, and the like. C's operators, in contrast, are essentially useless for working with strings. Strings are treated as arrays in C, so they're restricted in the same ways as arrays—in particular, they can't be copied or compared using operators.

Direct attempts to copy or compare strings will fail. For example, suppose that `str1` and `str2` have been declared as follows:

```
char str1[10], str2[10];
```

Copying a string into a character array using the = operator is not possible:

```
str1 = "abc";   /*** WRONG ***/
str2 = str1;    /*** WRONG ***/
```

We saw in Section 12.3 that using an array name as the left operand of = is illegal. *Initializing* a character array using = is legal, though:

```
char str1[10] = "abc";
```

In the context of a declaration, = is not the assignment operator.

Attempting to compare strings using a relational or equality operator is legal but won't produce the desired result:

```
if (str1 == str2) ...   /*** WRONG ***/
```

This statement compares `str1` and `str2` as *pointers*; it doesn't compare the contents of the two arrays. Since `str1` and `str2` have different addresses, the expression `str1 == str2` must have the value 0.

Fortunately, all is not lost: the C library provides a rich set of functions for performing operations on strings. Prototypes for these functions reside in the `<string.h>` header, so programs that need string operations should contain the following line:

`<string.h>` header ➤23.6

```
#include <string.h>
```

Most of the functions declared in `<string.h>` require at least one string as an argument. String parameters are declared to have type `char *`, allowing the argument to be a character array, a variable of type `char *`, or a string literal—all are suitable as strings. Watch out for string parameters that aren't declared `const`, however. Such a parameter may be modified when the function is called, so the corresponding argument shouldn't be a string literal.