

The first `printf` shows the original value of `i`, before it is incremented. The second `printf` shows the new value. As these examples illustrate, `++i` means “increment `i` immediately,” while `i++` means “use the old value of `i` for now, but increment `i` later.” How much later? The C standard doesn’t specify a precise time, but it’s safe to assume that `i` will be incremented before the next statement is executed.

Q&A

The `--` operator has similar properties:

```
i = 1;
printf("i is %d\n", --i);    /* prints "i is 0" */
printf("i is %d\n", i);      /* prints "i is 0" */

i = 1;
printf("i is %d\n", i--);    /* prints "i is 1" */
printf("i is %d\n", i);      /* prints "i is 0" */
```

When `++` or `--` is used more than once in the same expression, the result can often be hard to understand. Consider the following statements:

```
i = 1;
j = 2;
k = ++i + j++;
```

What are the values of `i`, `j`, and `k` after these statements are executed? Since `i` is incremented *before* its value is used, but `j` is incremented *after* it is used, the last statement is equivalent to

```
i = i + 1;
k = i + j;
j = j + 1;
```

so the final values of `i`, `j`, and `k` are 2, 3, and 4, respectively. In contrast, executing the statements

```
i = 1;
j = 2;
k = i++ + j++;
```

will give `i`, `j`, and `k` the values 2, 3, and 3, respectively.

For the record, the postfix versions of `++` and `--` have higher precedence than unary plus and minus and are left associative. The prefix versions have the same precedence as unary plus and minus and are right associative.

4.4 Expression Evaluation

Table 4.2 summarizes the operators we’ve seen so far. (Appendix A has a similar table that shows *all* operators.) The first column shows the precedence of each