Ifs

1 The If Statement

The *if statement* is the primary selection control structure. The format is

```
if ( condition )
    then_code ;
```

The condition is a boolean condition as before. If the condition is true the *then_code* is executed; if the condition is false the *then_code* is skipped. A *statement* is a single piece of code; a *block* is several statements enclosed in braces. Here is an example:

```
if( gradePointAverage >= 3.0) {
    printf("Scholarship retained");
}
```

2 The If-Else Statement

A more general version of the *if* statement is the *if–else* structure for executing a statement when the condition is not true. Here the format is

```
if ( condition )
    then_code
else
    otherwise_code
```

Here is an example:

```
if(denom==0)
    printf("Unable to process fraction");
else
    printf("Fraction in decimal is %4.2f", ((float)numer)/denom);
```

Note the “cast” is the previous line: it tells the compiler to treat the *numer* value as a float.

In other words, the *else* part is optional. A common error is to miss the semi-colon before the *else*, or to have a semi-colon after the condition.
3 Sample Program: listMax.c

Here is a standard way of determining the maximum of a collection of values. The idea is to maintain a variable maxSoFar with the maximum value seen so far; this variable is updated each time a new value is seen by comparing it with that value. There is a standard problem of how to initialize the value of maxSoFar. This program sidesteps this by assuming that all values are nonnegative, and therefore the maximum is at least zero. Another approach is to initialize the value of maxSoFar to the first value that is read.

/* calculate maximum of user input
 * Assumes values nonnegative
 * wdg 2009
 */
#include <stdio.h>

int main( )
{
    const int LENGTH = 10;
    printf("Enter %d values\n", LENGTH);
    float maxSoFar = 0.0;

    int i;
    float value;

    for(i=0; i<LENGTH; i++) {
        printf("Enter value ");
        scanf("%f", &value);
        if( value > maxSoFar )
            maxSoFar = value;
    }

    printf( "Max is %4.1f\n", maxSoFar );
    return 0;
}