Nesting may also be used with while loops and do while loops, or in combinations of loops. The program in Figure 8-14 nests a do while loop in a for loop.

The program in Figure 8-14 asks the user for the number of U.S. Representatives in his or her state. A for loop is used to ask the user to identify the party of each representative. The do while loop is used to repeat the prompt if the user enters an invalid party choice.

EXERCISE 8-9 MORE NESTED LOOPS

1. Open *REPS.CPP*.
2. Study the program carefully before you run it.
3. Compile and run the program. Enter some invalid data to cause the nested loop to iterate. If you have trouble understanding the program, study the source code and run it again.
4. Close the source code file.

SECTION 8.2 QUESTIONS

1. Where does a do while loop test the control expression?
2. What is the term for a loop without a way to end?
3. What is the loop control expression in the code segment below?

```
while (!done)
  {
   if (i < 1)
    { done = TRUE; }
   i--;
  }
```

4. What is the error in the code segment below?

```
do;
  {
   if (i < 1)
     { done = TRUE; }
   i--;
  }
while (!done);
```

5. Write a loop that prints your name to the screen once, and then asks you to enter 0 (zero) to stop the program or any other number to print the name again.
6. Write a for loop to print the odd numbers from 1 to 999.

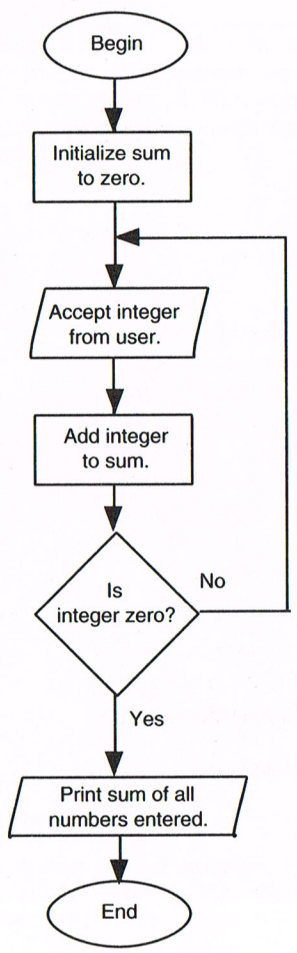

FIGURE 8-15

PROBLEM 8.2.1

Write a program that implements the flow chart in Figure 8-15. Save the source file as *SUMITUP.CPP*.

PROBLEM 8.2.2

Write a program that prints the numbers 1 to 20, but skips the numbers 15, 16, and 17. Save the source code file as *SKIPTHEM.CPP*.

PROBLEM 8.2.3

Modify the program from Exercise 8-9 (*REPS.CPP*) so that it calculates the percentage of your state's representatives that belong to each party. Save the modified source code as *REPS2.CPP*.

PROBLEM 8.2.4

1. Write a program that asks the user for a series of integers one at a time. When the user enters the integer 0, the program displays the following information:
   - the number of integers in the series (not including zero)
   - the average of the integers
   - the largest integer in the series
   - the smallest integer in the series
   - the difference between the largest and smallest integer in the series
2. Save the source file as *INTS.CPP*.

KEY TERMS

control expression
do while loop
event driven
event loop
for loop
infinite loop
initializing expression
iteration
iteration structures
loop
nested loop
parameter
step expression
while loop

SUMMARY

- A loop is a group of statements that is repeated a number of times. A loop is an iteration structure.
- A for loop causes one or more statements to be repeated a specified number of times. The three parameters of a for loop are the initializing expression, the control expression, and the step expression.