that range. This assumption is true for the ASCII code, but it need not be true in general.

Listing 6.8 demonstrates some functions from this family. In particular, it uses `isalpha()`, which tests for alphabetic characters; `isdigit()`, which tests for digit characters, such as 3; `isspace()`, which tests for white-space characters, such as newlines, spaces, and tabs; and `ispunct()`, which tests for punctuation characters. The program also reviews the if else if structure and using a while loop with `cin.get(char)`.

Listing 6.8 cctypes.cpp

```
// cctypes.cpp--use ctype.h library
#include <iostream>
#include <cctype>              // prototypes for character functions
using namespace std;
int main()
{
    cout << "Enter text for analysis, and type @"
         " to terminate input.\n";
    char ch;
    int whitespace = 0;
    int digits = 0;
    int chars = 0;
    int punct = 0;
    int others = 0;

    cin.get(ch);                // get first character
    while(ch != '@')            // test for sentinal
    {
        if(isalpha(ch))         // is it an alphabetic character?
            chars++;
        else if(isspace(ch))    // is it a whitespace character?
            whitespace++;
        else if(isdigit(ch))    // is it a digit?
            digits++;
        else if(ispunct(ch))    // is it punctuation?
            punct++;
```