MathBits.com

Computer Science 2

Topic: Library Functions

Return to Topic Menu | Computer Science Main Page | MathBits.com | Terms of Use | Resource CD

Character Functions

Built-in Library Functions for Character Classifications and Conversion

Required header: #include <ctype.h>

C++ uses the American Standard Code for Information Interchange (ASCII) character set. The CTYPE library includes character classification functions. A character is passed to the functions and the functions return values that can be stored or printed.

Basic ASCII Categories:

Category	ASCII Characters
Uppercase letters	'A' through 'Z'
Lowercase letters	'a' through 'z'
Digits (0 through 9)	'0' through '9'
Whitespace	Space, tab, line feed(newline), and carriage return
Punctuation	!"#$%&'()*+,-./:;<=>?@[\]^_{|}~
Blank space	The blank space character

Most common CTYPE functions:

1. isalnum( ) returns a TRUE (nonzero) if the argument is digit 0-9, or an alphabetic character (**alphnumeric**). Otherwise returns FALSE.
2. isalpha( ) returns TRUE if the argument is an upper or lower case letter.
3. isascii( ) returns TRUE if the integer argument is in the ASCII range 0-127. Treats 128-255 as non-ASCII.

You should use isascii( ) to verify that an integer value is indeed a valid ASCII character before using any of the functions #4 through #9.

4. isdigit( ) returns TRUE if the argument is a digit 0 - 9

<ctype.h>

Warning: **You cannot pass an entire string to character functions.** If you want to test the elements of a string, you must pass the string one element at a time.

Note: Even though these functions' prototypes specify an integer argument, you may pass a single character variable when you call it. If you pass an integer to these functions, the functions will act upon the corresponding ASCII character associated with your integer. (i.e. int i = 65; and char j = 'A'; are the same.)

The first 128 ASCII characters (0-127) are universal. Character codes 128-255 may not be available -- check your system!

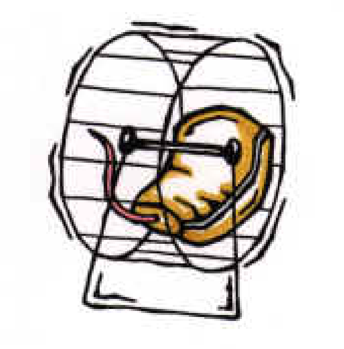
5. isgraph( ) returns TRUE if the argument is any printable character from ASCII 32 to 127, except the space.

6. islower( ) returns TRUE if the argument is a lowercase letter.

7. isupper( ) returns TRUE if the argument is an uppercase leter.

8. ispunct( ) returns TRUE if the argument is any punctuation character (see chart above).

9. isspace( ) returns TRUE if the argument is a whitespace (see chart above).



The following character functions are conversion functions.

toascii( ) converts the argument (an arbitrary integer) to a valid ASCII character number 0-127.

```
c = toascii(500);   //c gets number 116
                    // (modulus 500%128)
c = toascii('d');   //c gets number 100
```

tolower( ) converts the argument (an uppercase ASCII character) to lowercase.

```
c = tolower('Q');  // c becomes 'q'
```

toupper( ) converts the argument (a lowercase ASCII character) to uppercase.

```
c = toupper('q');  //c becomes 'Q'
```

****Note:** tolower( ) and toupper( ) will actually check to see if the argument is the appropriate uppercase or lowercase before making the conversion.

Return to Topic Menu | Computer Science Main Page | MathBits.com | Terms of Use | Resource CD