

**NAME**

isalnum, isalpha, isascii, isblank, iscntrl, isdigit, isgraph, islower, isprint, ispunct, isspace, isupper, isxdigit, isalnum\_l, isalpha\_l, isascii\_l, isblank\_l, iscntrl\_l, isdigit\_l, isgraph\_l, islower\_l, isprint\_l, ispunct\_l, isspace\_l, isupper\_l, isxdigit\_l – character classification functions

**SYNOPSIS**

```
#include <ctype.h>

int isalnum(int c);
int isalpha(int c);
int iscntrl(int c);
int isdigit(int c);
int isgraph(int c);
int islower(int c);
int isprint(int c);
int ispunct(int c);
int isspace(int c);
int isupper(int c);
int isxdigit(int c);

int isascii(int c);
int isblank(int c);

int isalnum_l(int c, locale_t locale);
int isalpha_l(int c, locale_t locale);
int isblank_l(int c, locale_t locale);
int iscntrl_l(int c, locale_t locale);
int isdigit_l(int c, locale_t locale);
int isgraph_l(int c, locale_t locale);
int islower_l(int c, locale_t locale);
int isprint_l(int c, locale_t locale);
int ispunct_l(int c, locale_t locale);
int isspace_l(int c, locale_t locale);
int isupper_l(int c, locale_t locale);
int isxdigit_l(int c, locale_t locale);

int isascii_l(int c, locale_t locale);
```

Feature Test Macro Requirements for glibc (see **feature\_test\_macros(7)**):

```
isascii():
    _XOPEN_SOURCE
    || /* Glibc since 2.19: */ _DEFAULT_SOURCE
    || /* Glibc versions <= 2.19: */ _SVID_SOURCE

isblank():
    _ISOC99_SOURCE || _POSIX_C_SOURCE >= 200112L

isalnum_l(), isalpha_l(), isblank_l(), iscntrl_l(), isdigit_l(), isgraph_l(), islower_l(), isprint_l(), is-
punct_l(), isspace_l(), isupper_l(), isxdigit_l():
    Since glibc 2.10:
        _XOPEN_SOURCE >= 700
    Before glibc 2.10:
        _GNU_SOURCE

isascii_l():
    Since glibc 2.10:
        _XOPEN_SOURCE >= 700 && (_SVID_SOURCE || _BSD_SOURCE)
```

Before glibc 2.10:  
     \_GNU\_SOURCE

## DESCRIPTION

These functions check whether *c*, which must have the value of an *unsigned char* or **EOF**, falls into a certain character class according to the specified locale. The functions without the "\_l" suffix perform the check based on the current locale.

The functions with the "\_l" suffix perform the check based on the locale specified by the locale object *locale*. The behavior of these functions is undefined if *locale* is the special locale object **LC\_GLOBAL\_LOCALE** (see **duplocale(3)**) or is not a valid locale object handle.

The list below explains the operation of the functions without the "\_l" suffix; the functions with the "\_l" suffix differ only in using the locale object *locale* instead of the current locale.

### **isalnum()**

checks for an alphanumeric character; it is equivalent to **(isalpha(c) || isdigit(c))**.

### **isalpha()**

checks for an alphabetic character; in the standard "C" locale, it is equivalent to **(isupper(c) || islower(c))**. In some locales, there may be additional characters for which **isalpha()** is true—letters which are neither uppercase nor lowercase.

### **isascii()**

checks whether *c* is a 7-bit *unsigned char* value that fits into the ASCII character set.

### **isblank()**

checks for a blank character; that is, a space or a tab.

### **iscntrl()**

checks for a control character.

### **isdigit()**

checks for a digit (0 through 9).

### **isgraph()**

checks for any printable character except space.

### **islower()**

checks for a lowercase character.

### **isprint()**

checks for any printable character including space.

### **ispunct()**

checks for any printable character which is not a space or an alphanumeric character.

### **isspace()**

checks for white-space characters. In the "C" and "POSIX" locales, these are: space, form-feed (**␣**), newline (**␣**), carriage return (**␣**), horizontal tab (**␣**), and vertical tab (**␣**).

### **isupper()**

checks for an uppercase letter.

### **isxdigit()**

checks for hexadecimal digits, that is, one of  
**0 1 2 3 4 5 6 7 8 9 a b c d e f A B C D E F**.

## RETURN VALUE

The values returned are nonzero if the character *c* falls into the tested class, and zero if not.

## VERSIONS

**isalnum\_l()**, **isalpha\_l()**, **isblank\_l()**, **iscntrl\_l()**, **isdigit\_l()**, **isgraph\_l()**, **islower\_l()**, **isprint\_l()**, **ispunct\_l()**, **isspace\_l()**, **isupper\_l()**, **isxdigit\_l()**, and **isascii\_l()** are available since glibc 2.3.

## ATTRIBUTES

For an explanation of the terms used in this section, see [attributes\(7\)](#).

| Interface  | Attribute     | Value   |
|--|---------------|---------|
| <b>isalnum()</b> , <b>isalpha()</b> , <b>isascii()</b> , <b>isblank()</b> , <b>isctrl()</b> , <b>isdigit()</b> , <b>isgraph()</b> , <b>islower()</b> , <b>isprint()</b> , <b>ispunct()</b> , <b>isspace()</b> , <b>isupper()</b> , <b>isxdigit()</b> | Thread safety | MT-Safe |

## CONFORMING TO

C89 specifies **isalnum()**, **isalpha()**, **isctrl()**, **isdigit()**, **isgraph()**, **islower()**, **isprint()**, **ispunct()**, **isspace()**, **isupper()**, and **isxdigit()**, but not **isascii()** and **isblank()**. POSIX.1-2001 also specifies those functions, and also **isascii()** (as an XSI extension) and **isblank()**. C99 specifies all of the preceding functions, except **isascii()**.

POSIX.1-2008 marks **isascii()** as obsolete, noting that it cannot be used portably in a localized application.

POSIX.1-2008 specifies **isalnum\_l()**, **isalpha\_l()**, **isblank\_l()**, **isctrl\_l()**, **isdigit\_l()**, **isgraph\_l()**, **islower\_l()**, **isprint\_l()**, **ispunct\_l()**, **isspace\_l()**, **isupper\_l()**, and **isxdigit\_l()**.

**isascii\_l()** is a GNU extension.

## NOTES

The standards require that the argument *c* for these functions is either **EOF** or a value that is representable in the type *unsigned char*. If the argument *c* is of type *char*, it must be cast to *unsigned char*, as in the following example:

```
char c;
...
res = toupper((unsigned char) c);
```

This is necessary because *char* may be the equivalent of *signed char*, in which case a byte where the top bit is set would be sign extended when converting to *int*, yielding a value that is outside the range of *unsigned char*.

The details of what characters belong to which class depend on the locale. For example, **isupper()** will not recognize an A-umlaut (Ä) as an uppercase letter in the default **C** locale.

## SEE ALSO

**iswalnum(3)**, **iswalpha(3)**, **iswblank(3)**, **iswctrl(3)**, **iswdigit(3)**, **iswgraph(3)**, **iswlower(3)**, **iswprint(3)**, **iswpunct(3)**, **iswspace(3)**, **iswupper(3)**, **iswxdigit(3)**, **newlocale(3)**, **setlocale(3)**, **toascii(3)**, **tolower(3)**, **toupper(3)**, **uselocale(3)**, **ascii(7)**, **locale(7)**

## COLOPHON

This page is part of release 5.02 of the Linux *man-pages* project. A description of the project, information about reporting bugs, and the latest version of this page, can be found at <https://www.kernel.org/doc/man-pages/>.