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

LIBRARY

Standard C library (*libc*, *−lc*)

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 >= 2.19: */ _DEFAULT_SOURCE
    || /* glibc <= 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**(), **ispunct_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 (**'\f'**), newline (**'\n'**), carriage return (**'\r'**), horizontal tab (**'\t'**), and vertical tab (**'\v'**).

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
isalnum(), **isalpha**(), **isascii**(), **isblank**(), **iscntrl**(), **isdigit**(), **isgraph**(), **islower**(), **isprint**(), **ispunct**(), **isspace**(), **isupper**(), **isxdigit**()	Thread safety	MT-Safe

STANDARDS

POSIX.1-2001 specifies **isalnum**(), **isalpha**(), **isblank**(), **iscntrl**(), **isdigit**(), **isgraph**(), **islower**(), **isprint**(), **ispunct**(), **isspace**(), **isupper**(), and **isxdigit**(), and also **isascii**() (as an XSI extension). 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**(), **iscntrl_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), **iswcntrl**(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)