

## NAME

**ls** — list directory contents

## SYNOPSIS

**ls** [ **-ABCFGHLOPRSTUW@abcdefghijklmnopqrstuvwxyz1%** ] [*file* ...]

## DESCRIPTION

For each operand that names a *file* of a type other than directory, **ls** displays its name as well as any requested, associated information. For each operand that names a *file* of type directory, **ls** displays the names of files contained within that directory, as well as any requested, associated information.

If no operands are given, the contents of the current directory are displayed. If more than one operand is given, non-directory operands are displayed first; directory and non-directory operands are sorted separately and in lexicographical order.

The following options are available:

- e** Display extended attribute keys and sizes in long ( **-l** ) output.
- l** (The numeric digit “one”.) Force output to be one entry per line. This is the default when output is not to a terminal.
- A** List all entries except for . and . . . Always set for the super-user.
- a** Include directory entries whose names begin with a dot ( . ).
- B** Force printing of non-printable characters (as defined by ctype(3) and current locale settings) in file names as \xxx, where xxx is the numeric value of the character in octal.
- b** As **-B**, but use C escape codes whenever possible.
- C** Force multi-column output; this is the default when output is to a terminal.
- c** Use time when file status was last changed for sorting ( **-t** ) or long printing ( **-l** ).
- d** Directories are listed as plain files (not searched recursively).
- e** Print the Access Control List (ACL) associated with the file, if present, in long ( **-l** ) output.
- F** Display a slash ( '/' ) immediately after each pathname that is a directory, an asterisk ( '\*' ) after each that is executable, an at sign ( '@' ) after each symbolic link, an equals sign ( '=' ) after each socket, a percent sign ( '%' ) after each whiteout, and a vertical bar ( '|' ) after each that is a FIFO.
- f** Output is not sorted. This option turns on the **-a** option.
- G** Enable colorized output. This option is equivalent to defining CLICOLOR in the environment. (See below.)
- g** This option is only available for compatibility with POSIX; it is used to display the group name in the long ( **-l** ) format output (the owner name is suppressed).
- H** Symbolic links on the command line are followed. This option is assumed if none of the **-F**, **-d**, or **-l** options are specified.
- h** When used with the **-l** option, use unit suffixes: Byte, Kilobyte, Megabyte, Gigabyte, Terabyte and Petabyte in order to reduce the number of digits to three or less using base 2 for sizes.
- i** For each file, print the file’s file serial number (inode number).
- k** If the **-s** option is specified, print the file size allocation in kilobytes, not blocks. This option overrides the environment variable BLOCKSIZE.
- L** Follow all symbolic links to final target and list the file or directory the link references rather than the link itself. This option cancels the **-P** option.
- l** (The lowercase letter “ell”.) List in long format. (See below.) A total sum for all the file sizes is output on a line before the long listing.

- m** Stream output format; list files across the page, separated by commas.
- n** Display user and group IDs numerically, rather than converting to a user or group name in a long ( **-l** ) output. This option turns on the **-l** option.
- O** Include the file flags in a long ( **-l** ) output.
- o** List in long format, but omit the group id.
- P** If argument is a symbolic link, list the link itself rather than the object the link references. This option cancels the **-H** and **-L** options.
- p** Write a slash ( **/'** ) after each filename if that file is a directory.
- q** Force printing of non-graphic characters in file names as the character **'?'**; this is the default when output is to a terminal.
- R** Recursively list subdirectories encountered.
- r** Reverse the order of the sort to get reverse lexicographical order or the oldest entries first (or largest files last, if combined with sort by size
- S** Sort files by size
- s** Display the number of file system blocks actually used by each file, in units of 512 bytes, where partial units are rounded up to the next integer value. If the output is to a terminal, a total sum for all the file sizes is output on a line before the listing. The environment variable **BLOCKSIZE** overrides the unit size of 512 bytes.
- T** When used with the **-l** (lowercase letter "ell") option, display complete time information for the file, including month, day, hour, minute, second, and year.
- t** Sort by time modified (most recently modified first) before sorting the operands by lexicographical order.
- u** Use time of last access, instead of last modification of the file for sorting ( **-t** ) or long printing ( **-l** ).
- U** Use time of file creation, instead of last modification for sorting ( **-t** ) or long output ( **-l** ).
- v** Force unedited printing of non-graphic characters; this is the default when output is not to a terminal.
- W** Display whiteouts when scanning directories. ( **-S** ) flag).
- w** Force raw printing of non-printable characters. This is the default when output is not to a terminal.
- x** The same as **-C**, except that the multi-column output is produced with entries sorted across, rather than down, the columns.
- %** Distinguish dataless files and directories with a **'%'** character in long ( **-l** ) output, and don't materialize dataless directories when listing them.

The **-l**, **-C**, **-x**, and **-l** options all override each other; the last one specified determines the format used.

The **-c** and **-u** options override each other; the last one specified determines the file time used.

The **-B**, **-b**, **-w**, and **-q** options all override each other; the last one specified determines the format used for non-printable characters.

The **-H**, **-L** and **-P** options all override each other (either partially or fully); they are applied in the order specified.

By default, **ls** lists one entry per line to standard output; the exceptions are to terminals or when the **-C** or **-x** options are specified.

File information is displayed with one or more `<blank>`s separating the information associated with the **-i**, **-s**, and **-l** options.

### The Long Format

If the **-l** option is given, the following information is displayed for each file: file mode, number of links, owner name, group name, number of bytes in the file, abbreviated month, day-of-month file was last modified, hour file last modified, minute file last modified, and the pathname. In addition, for each directory whose contents are displayed, the total number of 512-byte blocks used by the files in the directory is displayed on a line by itself, immediately before the information for the files in the directory. If the file or directory has extended attributes, the permissions field printed by the **-l** option is followed by a '@' character. Otherwise, if the file or directory has extended security information (such as an access control list), the permissions field printed by the **-l** option is followed by a '+' character. If the **-%** option is given, a '%' character follows the permissions field for dataless files and directories, possibly replacing the '@' or '+' character.

If the modification time of the file is more than 6 months in the past or future, then the year of the last modification is displayed in place of the hour and minute fields.

If the owner or group names are not a known user or group name, or the **-n** option is given, the numeric ID's are displayed.

If the file is a character special or block special file, the major and minor device numbers for the file are displayed in the size field. If the file is a symbolic link, the pathname of the linked-to file is preceded by `"->"`.

The file mode printed under the **-l** option consists of the entry type, owner permissions, and group permissions. The entry type character describes the type of file, as follows:

- b** Block special file.
- c** Character special file.
- d** Directory.
- l** Symbolic link.
- s** Socket link.
- p** FIFO.
- Regular file.

The next three fields are three characters each: owner permissions, group permissions, and other permissions. Each field has three character positions:

1. If **r**, the file is readable; if **-**, it is not readable.
2. If **w**, the file is writable; if **-**, it is not writable.
3. The first of the following that applies:
  - S** If in the owner permissions, the file is not executable and set-user-ID mode is set. If in the group permissions, the file is not executable and set-group-ID mode is set.
  - s** If in the owner permissions, the file is executable and set-user-ID mode is set. If in the group permissions, the file is executable and setgroup-ID mode is set.
  - x** The file is executable or the directory is searchable.
  - The file is neither readable, writable, executable, nor set-user-ID nor set-group-ID mode, nor sticky. (See below.)

These next two apply only to the third character in the last group (other permissions).

- T** The sticky bit is set (mode 1000), but not execute or search permission. (See `chmod(1)` or `sticky(8)`.)
- t** The sticky bit is set (mode 1000), and is searchable or executable. (See `chmod(1)` or `sticky(8)`.)

## EXAMPLES

The following is how to do an **ls** listing sorted by increasing size

```
ls -lrS
```

## DIAGNOSTICS

The **ls** utility exits 0 on success, and >0 if an error occurs.

## ENVIRONMENT

The following environment variables affect the execution of **ls**:

BLOCKSIZE	If the environment variable BLOCKSIZE is set, the block counts (see <b>-s</b> ) will be displayed in units of that size block.
CLICOLOR	Use ANSI color sequences to distinguish file types. See LSCOLORS below. In addition to the file types mentioned in the <b>-F</b> option some extra attributes (setuid bit set, etc.) are also displayed. The colorization is dependent on a terminal type with the proper <code>termcap(5)</code> capabilities. The default “cons25” console has the proper capabilities, but to display the colors in an <code>xterm(1)</code> , for example, the TERM variable must be set to “ <code>xterm-color</code> ”. Other terminal types may require similar adjustments. Colorization is silently disabled if the output isn’t directed to a terminal unless the CLICOLOR_FORCE variable is defined.
CLICOLOR_FORCE	Color sequences are normally disabled if the output isn’t directed to a terminal. This can be overridden by setting this flag. The TERM variable still needs to reference a color capable terminal however otherwise it is not possible to determine which color sequences to use.
COLUMNS	If this variable contains a string representing a decimal integer, it is used as the column position width for displaying multiple-text-column output. The <b>ls</b> utility calculates how many pathname text columns to display based on the width provided. (See <b>-C</b> and <b>-x</b> .)
LANG	The locale to use when determining the order of day and month in the long <b>-l</b> format output. See <code>environ(7)</code> for more information.
LSCOLORS	The value of this variable describes what color to use for which attribute when colors are enabled with CLICOLOR. This string is a concatenation of pairs of the format <i>Fb</i> , where <i>F</i> is the foreground color and <i>b</i> is the background color.

The color designators are as follows:

<b>a</b>	black
<b>b</b>	red
<b>c</b>	green
<b>d</b>	brown
<b>e</b>	blue
<b>f</b>	magenta
<b>g</b>	cyan
<b>h</b>	light grey

<b>A</b>	bold black, usually shows up as dark grey
<b>B</b>	bold red
<b>C</b>	bold green
<b>D</b>	bold brown, usually shows up as yellow
<b>E</b>	bold blue
<b>F</b>	bold magenta
<b>G</b>	bold cyan
<b>H</b>	bold light grey; looks like bright white
<b>x</b>	default foreground or background

Note that the above are standard ANSI colors. The actual display may differ depending on the color capabilities of the terminal in use.

The order of the attributes are as follows:

1. directory
2. symbolic link
3. socket
4. pipe
5. executable
6. block special
7. character special
8. executable with setuid bit set
9. executable with setgid bit set
10. directory writable to others, with sticky bit
11. directory writable to others, without sticky bit

The default is "exfxcxdxbxegedabagacad", i.e. blue foreground and default background for regular directories, black foreground and red background for setuid executables, etc.

LS_COLWIDTHS	If this variable is set, it is considered to be a colon-delimited list of minimum column widths. Unreasonable and insufficient widths are ignored (thus zero signifies a dynamically sized column). Not all columns have changeable widths. The fields are, in order: inode, block count, number of links, user name, group name, flags, file size, file name.
TERM	The CLICOLOR functionality depends on a terminal type with color capabilities.
TZ	The timezone to use when displaying dates. See <code>environ(7)</code> for more information.

## COMPATIBILITY

The group field is now automatically included in the long listing for files in order to be compatible with the IEEE Std 1003.2 ("POSIX.2") specification.

## LEGACY DESCRIPTION

In legacy mode, the **-f** option does not turn on the **-a** option and the **-g**, **-n**, and **-o** options do not turn on the **-l** option.

Also, the **-o** option causes the file flags to be included in a long (-l) output; there is no **-O** option.

When **-H** is specified (and not overridden by **-L** or **-P**) and a file argument is a symlink that resolves to a non-directory file, the output will reflect the nature of the link, rather than that of the file. In legacy operation, the output will describe the file.

For more information about legacy mode, see `compat(5)`.

**SEE ALSO**

`chflags(1)`, `chmod(1)`, `sort(1)`, `xterm(1)`, `compat(5)`, `termcap(5)`, `symlink(7)`, `sticky(8)`

**STANDARDS**

The **ls** utility conforms to IEEE Std 1003.1-2001 (“POSIX.1”).

**HISTORY**

An **ls** command appeared in Version 1 AT&T UNIX.

**BUGS**

To maintain backward compatibility, the relationships between the many options are quite complex.