

NAME

ls - list contents of directory

SYNOPSIS

```
ls [ -abcdfgilmqrstuxiCFR ] name ...
l [ ls options ] name ...
```

DESCRIPTION

For each directory argument, ls lists the contents of the directory; for each file argument, ls repeats its name and any other information requested. The output is sorted alphabetically by default. When no argument is given, the current directory is listed. When several arguments are given, the arguments are first sorted appropriately, but file arguments appear before directories and their contents.

There are three major listing formats. The format chosen depends on whether the output is going to a teletype, and may also be controlled by option flags. The default format for a teletype is to list the contents of directories in multi-column format, with the entries sorted down the columns. (Files which are not the contents of a directory being interpreted are always sorted across the page rather than down the page in columns. This is because the individual file names may be arbitrarily long.) If the standard output is not a teletype, the default format is to list one entry per line. Finally, there is a stream output format in which files are listed across the page, separated by `,' characters. The `-m` flag enables this format; when invoked as `l` this format is also used.

There are an unbelievable number of options:

- `-l` List in long format, giving mode, number of links, owner, group, size in bytes, and time of last modification for each file. (See below.) If the file is a special file the size field will instead contain the major and minor device numbers.
- `-t` Sort by time modified (latest first) instead of by name, as is normal.
- `-a` List all entries; usually `,' and `,' are suppressed.
- `-s` Give size in blocks, including indirect blocks, for each entry.
- `-d` If argument is a directory, list only its name, not its contents (mostly used with `-l` to get status on directory).
- `-r` Reverse the order of sort to get reverse alphabetic or oldest first as appropriate.

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DESCRIPTION

The first part of the document describes the general structure of the system and the various components that make up the architecture. It includes a list of the main modules and their interactions.

The second part of the document provides a detailed description of the various modules and their internal structure. It includes a list of the main components and their interactions.

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- u Use time of last access instead of last modification for sorting (-t) or printing (-l).
- c Use time of file creation for sorting or printing.
- i Print i-number in first column of the report for each file listed.
- f Force each argument to be interpreted as a directory and list the name found in each slot. This option turns off -l, -t, -s, and -r, and turns on -a; the order is the order in which entries appear in the directory.
- g Give group ID instead of owner ID in long listing.
- m force stream output format
- l force one entry per line output format, e.g. to a teletype
- C force multi-column output, e.g. to a file or a pipe
- q force printing of non-graphic characters in file names as the character '?'; this normally happens only if the output device is a teletype
- b force printing of non-graphic characters to be in the \ddd notation, in octal.
- x force columnar printing to be sorted across rather than down the page; this is the default if the last character of the name the program is invoked with is an 'x'.
- F cause directories to be marked with a trailing '/' and executable files to be marked with a trailing '*'; this is the default if the last character of the name the program is invoked with is a 'f'.
- R recursively list subdirectories encountered.

The mode printed under the -l option contains 11 characters which are interpreted as follows: the first character is

- d if the entry is a directory;
- b if the entry is a block-type special file;
- c if the entry is a character-type special file;
- m if the entry is a multiplexor-type character special file;
- if the entry is a plain file.

The next 9 characters are interpreted as three sets of three bits each. The first set refers to owner permissions; the next to permissions to others in the same user-group; and the last to all others. Within each set the three characters indicate permission

respectively to read, to write, or to execute the file as a program. For a directory, 'execute' permission is interpreted to mean permission to search the directory for a specified file. The permissions are indicated as follows:

```
r  if the file is readable;
w  if the file is writable;
x  if the file is executable;
-  if the indicated permission is not granted.
```

The group-execute permission character is given as **s** if the file has set-group-ID mode; likewise the user-execute permission character is given as **s** if the file has set-user-ID mode.

The last character of the mode (normally 'x' or '-') is **t** if the 1000 bit of the mode is on. See `chmod(1)` for the meaning of this mode.

When the sizes of the files in a directory are listed, a total count of blocks, including indirect blocks is printed.

FILES

```
/etc/passwd to get user ID's for 'ls -l',
/etc/group  to get group ID's for 'ls -lg'.
```

BUGS

Newline and tab are considered printing characters in file names.

The output device is assumed to be 80 columns wide.

The option setting based on whether the output is a teletype is undesirable as `'ls -s'` is much different than `'ls -s | lpr'`. On the other hand, not doing this setting would make old shell scripts which used `ls` almost certain losers.

Column widths choices are poor for terminals which can tab.

