find Search the file tree

START HERE

`find . -name '*.txt'`
By name

`find . -size +10M`
Big files

`find . -type f`
Only files

`find . -maxdepth 1`
Don't recurse

`find . -type d`
Only directories

`find . -name '*.log' -delete`
Remove matches

`find . -mtime -7`
Changed this week

`find . -type f -exec <cmd> {} +`
Run a command

Start paths where to look → `options` **Options** depth, symlinks → `tests` **Tests** name, type, size, time → `actions` **Actions** print, exec, delete

CONCEPTS

find walks every path you give it and tests each file against the expression, left to right. Quote patterns so the shell does not expand them.

Without an action, find prints matches (-print). Test a command with -print before you switch to -delete or -exec.

Examples follow GNU findutils 4.10. BSD and macOS find lack -printf, -regextype and -type f,d, and use find -E for extended regex.

NAME & TYPE

`find <dir> -name '<glob>'`
Match the file name
Pattern is matched against the base name only; use -path for directories.

`find <dir> -iname '<glob>'`
Match name, ignore case

`find <dir> -type f`
Regular files only

`find <dir> -type d`
Directories only

`find <dir> -type l`
Symbolic links only

`find <dir> -path '<glob>'`
Match the whole path
The glob sees the full path as printed, so -path './src/' starts with the start point.*

`find <dir> -regex '<regex>'`
Regex on the whole path
Must match the entire path, not a part. Pick the dialect with -regextype.

`find <dir> -type f,d`
Several types at once
GNU extension, comma separated.

`find <dir> -xtype l`
Broken symlinks

SIZE & TIME

`find <dir> -size +<n>M`
Larger than n MiB
Sizes round up to the unit; -size +1M means more than 1 MiB.

SIZE & TIME (cont.)

`find <dir> -size -<n>k`
Smaller than n KiB

`find <dir> -empty`
Empty files and directories

`find <dir> -mtime -<n>`
Modified in the last n days

`find <dir> -mtime +<n>`
Modified more than n days ago
Days are rounded down: +1 means 2 or more full days.

`find <dir> -mmin -<n>`
Modified in the last n minutes

`find <dir> -newer <file>`
Newer than a reference file

`find <dir> -newermt '<date>'`
Modified after a date
Example: -newermt '2026-01-01'.

`find <dir> -atime +<n>`
Not read for n days

OWNER & PERMISSIONS

`find <dir> -user <name>`
Owned by a user

`find <dir> -group <name>`
Owned by a group

`find <dir> -perm 644`
Exactly these mode bits

`find <dir> -perm -u+x`
All listed bits set
-perm -mode needs every listed bit; extra bits are ignored.

`find <dir> -perm /022`
Any listed bit set
Here: writable by group or others.

`find <dir> -nouser`
Files with no valid owner

DEPTH & PRUNING

`find <dir> -maxdepth <n>`
Descend at most n levels
Put it before tests; GNU find warns when it comes later.

`find <dir> -mindepth <n>`
Ignore the top n levels
The start point is level 0, so -mindepth 1 skips only it.

DEPTH & PRUNING (cont.)

`find <dir> -name <d> -prune -o -print`
Skip a directory tree
-prune does nothing under -depth or -delete.

`find <dir> -xdev`
Stay on one filesystem

`find -L <dir>`
Follow symlinks
A global option: it goes before the start path.

`find <dir> -name <f> -print -quit`
Stop at first match

COMBINING

`find <dir> -name '*.c' -o -name '*.h'`
Either pattern (OR)
-o binds weaker than the implicit AND, so group with parentheses when mixing.

`find <dir> ! -name '<glob>'`
Negate a test

`find <dir> \( <a> -o <b> \) <c>`
Group with parentheses
Escape the parentheses from the shell.

`find <dir> <a> , <b>`
Evaluate both always

ACTIONS

`find <dir> -print`
Print matches (default)

`find <dir> -print0`
Print NUL-separated names

`find <dir> -exec <cmd> {} \;`
Run command once per file
{} becomes the path; the semicolon must be escaped.

`find <dir> -exec <cmd> {} +`
Batch files per command
Much faster; {} must be last, immediately before +.

`find <dir> -ok <cmd> {} \;`
Ask before each run

ACTIONS (cont.)

`find <dir> -execdir <cmd> {} \;`
Run inside the file's directory

`find <dir> -delete`
Delete matches
Implies -depth. Put it last: before the tests it deletes everything it reaches.

`find <dir> -printf '<fmt>'`
Custom output format
E.g. '%p %s\n' prints path and size in bytes.

`find <dir> -ls`
Long listing of matches

XARGS

`find <dir> -print0 | xargs -0 <cmd>`
Pipe names safely
Without -0 / -print0, spaces and newlines in names break.

`xargs -0 -n <n> <cmd>`
At most n names per run

`xargs -0 -P <n> <cmd>`
Run n jobs in parallel

`xargs -0 -I {} <cmd> {}`
Place name inside a command
Runs the command once per input item.

`xargs -r <cmd>`
Skip when input is empty
GNU option; avoids running the command with no arguments.

`xargs -0 -a <file> <cmd>`
Read names from a file

RECIPES

Delete old logs

```
find /var/log/app -name '*.log'
-mtime +30 -print
# check the list, then swap in
-delete
find /var/log/app -name '*.log'
-mtime +30 -delete
```

Replace text in many files

```
find . -name '*.md' -print0 \
  | xargs -0 sed -i 's/<old>/
<new>/g'
```

Grep, skipping .git

```
find . -name .git -prune -o -
type f \
  -exec grep -l '<text>' {} +
```

Ten biggest files

```
find . -type f -printf '%s
%p\n' \
  | sort -nr | head
```