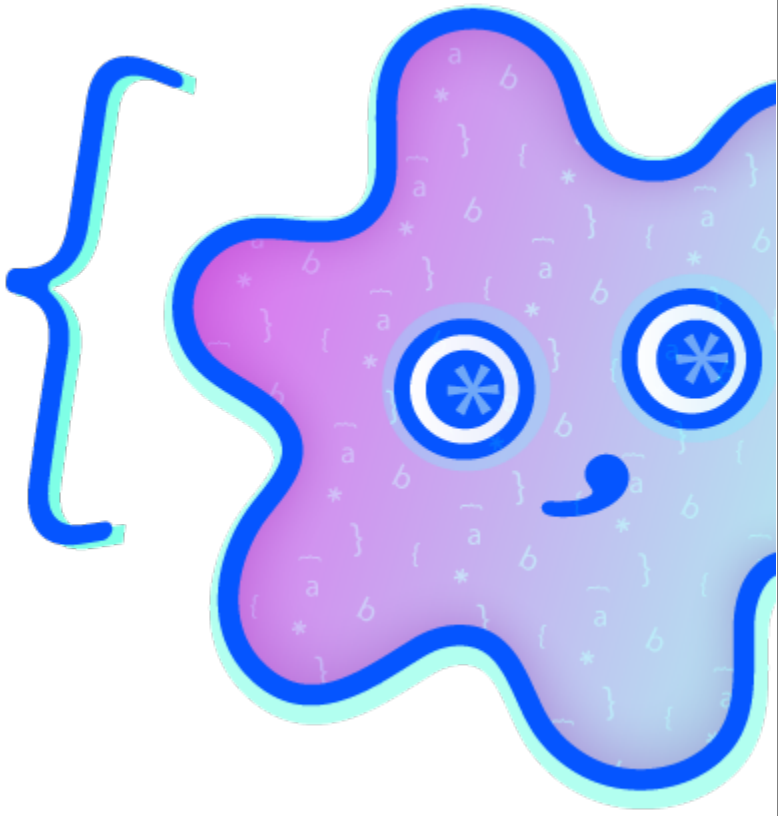
# Glob

Match files using the patterns the shell uses.

The most correct and second fastest glob implementation in JavaScript. (See **Comparison to Other JavaScript Glob Implementations** at the bottom of this readme.)



a fun cartoon logo made of glob characters

# Usage

Install with npm

```
npm i glob
```

*[!NOTE] The npm package name is not* `node-glob` *that's a different thing that was abandoned years ago. Just* `glob`.

```
// load using import
import { glob, globSync, globStream,
        globStreamSync, Glob } from
        'glob'
// or using commonjs, that's fine, too
const {
  glob,
  globSync,
  globStream,
  globStreamSync,
  Glob,
} = require('glob')

// the main glob() and globSync()
        resolve/return array of
        filenames

// all js files, but don't look in
        node_modules
const jsfiles = await glob('**/*.js', {
        ignore: 'node_modules/**' })
```



```
node current globSync mjs
0m0.626s  100000
node current glob syncStream
0m0.621s  100000
~~ async ~~
node fast-glob async
0m0.322s  100000
node globby async
0m0.404s  100000
node current glob async mjs
0m0.360s  100000
node current glob stream
0m0.352s  100000
```

```
0m0.659s  200023
~~ async ~~
node fast-glob async
0m0.357s  200023
node globby async
0m0.513s  200023
node current glob async mjs
0m0.471s  200023
node current glob stream
0m0.424s  200023

--- pattern: '**/*/**/*.txt' ---
~~ sync ~~
node fast-glob sync
0m0.585s  200023
node globby sync
0m0.766s  200023
node current globSync mjs
0m0.694s  200023
node current glob syncStream
0m0.664s  200023
~~ async ~~
node fast-glob async
0m0.350s  200023
node globby async
0m0.514s  200023
node current glob async mjs
0m0.472s  200023
node current glob stream
0m0.424s  200023

--- pattern: '**/[0-9]/**/*.txt' ---
~~ sync ~~
node fast-glob sync
0m0.544s  100000
node globby sync
0m0.636s  100000
```



```
// pass in a signal to cancel the glob
        walk
const stopAfter100ms = await glob('**/
        *.css', {
  signal: AbortSignal.timeout(100),
})

// multiple patterns supported as well
const images = await glob(['css/*.
        {png,jpeg}', 'public/*.
        {png,jpeg}'])

// but of course you can do that with
        the glob pattern also
// the sync function is the same, just
        returns a string[] instead
// of Promise<string[]>
const imagesAlt =
        globSync('{css,public}/*.
        {png,jpeg}')

// you can also stream them, this is a
        Minipass stream
const filesStream = globStream(['**/
        *.dat', 'logs/**/*.log'])

// construct a Glob object if you wanna
        do it that way, which
// allows for much faster walks if you
        have to look in the same
// folder multiple times.
const g = new Glob('**/foo', {})
// glob objects are async iterators, can
        also do globIterate() or
```

```
// g.iterate(), same deal
for await (const file of g) {
  console.log('found a foo file:', file)
}
// pass a glob as the glob options to
        reuse its settings and caches
const g2 = new Glob('**/bar', g)
// sync iteration works as well
for (const file of g2) {
  console.log('found a bar file:', file)
}

// you can also pass withFileTypes: true
        to get Path objects
// these are like a fs.Dirent, but with
        some more added powers
// check out https://isaacs.github.io/
        path-scurry/classes/
        PathBase.html
// for more info on their API
const g3 = new Glob('**/baz/**', {
        withFileTypes: true })
g3.stream().on('data', path => {
  console.log(
    'got a path object',
    path.fullpath(),
    path.isDirectory(),
    path.readdirSync().map(e => e.name),
  )
})

// if you use stat:true and
        withFileTypes, you can sort
        results
```



```
node globby async
0m0.516s  200023
node current glob async mjs
0m0.432s  200023
node current glob stream
0m0.384s  200023

--- pattern: './**/**/**/**/**/**/**/
*.txt' ---
~~ sync ~~
node fast-glob sync
0m0.589s  200023
node globby sync
0m0.766s  200023
node current globSync mjs
0m0.682s  200023
node current glob syncStream
0m0.652s  200023
~~ async ~~
node fast-glob async
0m0.352s  200023
node globby async
0m0.523s  200023
node current glob async mjs
0m0.436s  200023
node current glob stream
0m0.380s  200023

--- pattern: '**/*/*.txt' ---
~~ sync ~~
node fast-glob sync
0m0.592s  200023
node globby sync
0m0.776s  200023
node current globSync mjs
0m0.691s  200023
node current glob syncStream
```

```
node current glob stream
0m0.455s  222137

--- pattern: './**/*/**/*/**/*/**/*/**/
*.txt' ---
~~ sync ~~
node fast-glob sync
0m0.622s  200000
node globby sync
0m0.792s  200000
node current globSync mjs
0m0.722s  200000
node current glob syncStream
0m0.695s  200000
~~ async ~~
node fast-glob async
0m0.369s  200000
node globby async
0m0.527s  200000
node current glob async mjs
0m0.502s  200000
node current glob stream
0m0.481s  200000

--- pattern: '**/*.txt' ---
~~ sync ~~
node fast-glob sync
0m0.588s  200023
node globby sync
0m0.771s  200023
node current globSync mjs
0m0.684s  200023
node current glob syncStream
0m0.658s  200023
~~ async ~~
node fast-glob async
0m0.352s  200023
```



```
// by things like modified time, filter
        by permission mode, etc.
// All Stats fields will be available in
        that case. Slightly
// slower, though.
// For example:
const results = await glob('**', {
        stat: true, withFileTypes:
        true })

const timeSortedFiles = results
  .sort((a, b) => a.mtimeMs - b.mtimeMs)
  .map(path => path.fullpath())

const groupReadableFiles = results
  .filter(path => path.mode & 0o040)
  .map(path => path.fullpath())

// custom ignores can be done like this,
        for example by saying
// you'll ignore all markdown files, and
        all folders named 'docs'
const customIgnoreResults = await
        glob('**', {
  ignore: {
    ignored: p => /\.md$/.test(p.name),
    childrenIgnored: p =>
        p.isNamed('docs'),
  },
})

// another fun use case, only return
        files with the same name as
```

```
// their parent folder, plus either
        `.ts` or `.js`
const folderNamedModules = await
        glob('**/*.{ts,js}', {
  ignore: {
    ignored: p => {
      const pp = p.parent
      return !(p.isNamed(pp.name +
        '.ts') || p.isNamed(pp.name +
        '.js'))
    },
  },
})

// find all files edited in the last
        hour, to do this, we ignore
// all of them that are more than an
        hour old
const newFiles = await glob('**', {
  // need stat so we have mtime
  stat: true,
  // only want the files, not the dirs
  nodir: true,
  ignore: {
    ignored: p => {
      return new Date() - p.mtime > 60
        * 60 * 1000
    },
    // could add similar childrenIgnored
        here as well, but
    // directory mtime is inconsistent
        across platforms, so
    // probably better not to, unless
        you know the system
```



```
~~ sync ~~
node fast-glob sync
0m0.568s  100000
node globby sync
0m0.651s  100000
node current globSync mjs
0m0.619s  100000
node current glob syncStream
0m0.617s  100000
~~ async ~~
node fast-glob async
0m0.332s  100000
node globby async
0m0.409s  100000
node current glob async mjs
0m0.372s  100000
node current glob stream
0m0.351s  100000

--- pattern: '**/*/**/*/**/*/**/*/**'
---
~~ sync ~~
node fast-glob sync
0m0.603s  200113
node globby sync
0m0.798s  200113
node current globSync mjs
0m0.730s  222137
node current glob syncStream
0m0.693s  222137
~~ async ~~
node fast-glob async
0m0.356s  200113
node globby async
0m0.525s  200113
node current glob async mjs
0m0.508s  222137
```

```
0m0.734s  200023
node current glob syncStream
0m0.696s  200023
~~ async ~~
node fast-glob async
0m0.286s  0
node globby async
0m0.296s  0
node current glob async mjs
0m0.506s  200023
node current glob stream
0m0.483s  200023

--- pattern: './0/**/../1/**/../2/**/../
3/**/../4/**/../5/**/../6/**/../7/**/
*.txt' ---
~~ sync ~~
node fast-glob sync
0m0.060s  0
node globby sync
0m0.074s  0
node current globSync mjs
0m0.067s  0
node current glob syncStream
0m0.066s  0
~~ async ~~
node fast-glob async
0m0.060s  0
node globby async
0m0.075s  0
node current glob async mjs
0m0.066s  0
node current glob stream
0m0.067s  0

--- pattern: './**/?/**/?/**/?/**/?/**/
*.txt' ---
```



```
    // tracks this reliably.
  },
})
```

*[!NOTE] Glob patterns should always use `/` as a path separator, even on Windows systems, as `\` is used to escape glob characters. If you wish to use `\` as a path separator instead of using it as an escape character on Windows platforms, you may set* `windowsPathsNoEscape:true` *in the options. In this mode, special glob characters cannot be escaped, making it impossible to match a literal `*` `?` and so on in filenames.*

# Command Line Interface

The glob CLI has been moved to the `glob-bin` package, and must be installed separately, as of version 13.

```
npm install glob-bin
```

```
glob(pattern: string |
  string[], options?:
    GlobOptions) =>
Promise<string[] | Path[]>
```

Perform an asynchronous glob search for the pattern(s) specified. Returns Path objects if the `withFileTypes` option is set to `true`. See below for full options field desciptions.

```
globSync(pattern: string |
    string[], options?:
GlobOptions) => string[] |
          Path[]
```

Synchronous form of `glob()`.

Alias: `glob.sync()`



```
node globby async
0m0.299s  0
node current glob async mjs
0m0.617s  200023
node current glob stream
0m0.568s  200023

--- pattern: './*/**/../*/**/../*/**/../
*/**/../*/**/../*/**/../*/**/../*/**/
*.txt' ---
~~ sync ~~
node fast-glob sync
0m0.485s  0
node globby sync
0m0.507s  0
node current globSync mjs
0m0.759s  200023
node current glob syncStream
0m0.740s  200023
~~ async ~~
node fast-glob async
0m0.281s  0
node globby async
0m0.297s  0
node current glob async mjs
0m0.544s  200023
node current glob stream
0m0.464s  200023

--- pattern: './*/**/../*/**/../*/**/../
*/**/../*/**/*.txt' ---
~~ sync ~~
node fast-glob sync
0m0.486s  0
node globby sync
0m0.513s  0
node current globSync mjs
```

```
0m0.451s  200023

--- pattern: '**/!(0|9).txt' ---
~~ sync ~~
node fast-glob sync
0m0.573s  160023
node globby sync
0m0.731s  160023
node current globSync mjs
0m0.680s  180023
node current glob syncStream
0m0.659s  180023
~~ async ~~
node fast-glob async
0m0.345s  160023
node globby async
0m0.476s  160023
node current glob async mjs
0m0.427s  180023
node current glob stream
0m0.388s  180023

--- pattern: './{*/**/../{*/**/../{*/
**/../{*/**/../{*/
**,,,,},,,,},,,,},,,,},,,,}/*.txt' ---
~~ sync ~~
node fast-glob sync
0m0.483s  0
node globby sync
0m0.512s  0
node current globSync mjs
0m0.811s  200023
node current glob syncStream
0m0.773s  200023
~~ async ~~
node fast-glob async
0m0.280s  0
```



## globIterate(pattern: string | string[], options?: GlobOptions) => AsyncGenerator<string>

Return an async iterator for walking glob pattern matches.

Alias: `glob.iterate()`

## globIterateSync(pattern: string | string[], options?: GlobOptions) => Generator<string>

Return a sync iterator for walking glob pattern matches.

Alias: `glob.iterate.sync()`, `glob.sync.iterate()`

## globStream(pattern: string | string[], options?: GlobOptions) => Minipass<string | Path>

Return a stream that emits all the strings or `Path` objects and then emits `end` when completed.

Alias: `glob.stream()`

## globStreamSync(pattern: string | string[], options?: GlobOptions) => Minipass<string | Path>

Syncronous form of `globStream()`. Will read all the matches as fast as you consume them, even all in a single tick if you consume them immediately, but will still respond to backpressure if they're not consumed immediately.

Alias: `glob.stream.sync()`, `glob.sync.stream()`



```
node fast-glob sync
0m0.547s  100000
node globby sync
0m0.673s  100000
node current globSync mjs
0m0.626s  100000
node current glob syncStream
0m0.618s  100000
~~ async ~~
node fast-glob async
0m0.315s  100000
node globby async
0m0.414s  100000
node current glob async mjs
0m0.366s  100000
node current glob stream
0m0.345s  100000

--- pattern: './{**/?{/**/?{/**/?{/
**/?,,,,},,,,},,,,},,,}/**/*.txt' ---
~~ sync ~~
node fast-glob sync
0m0.588s  100000
node globby sync
0m0.670s  100000
node current globSync mjs
0m0.717s  200023
node current glob syncStream
0m0.687s  200023
~~ async ~~
node fast-glob async
0m0.343s  100000
node globby async
0m0.418s  100000
node current glob async mjs
0m0.519s  200023
node current glob stream
```

```
0m0.539s  1000
node current glob syncStream
0m0.567s  1000
~~ async ~~
node fast-glob async
0m0.285s  1000
node globby async
0m0.299s  1000
node current glob async mjs
0m0.305s  1000
node current glob stream
0m0.301s  1000

--- pattern: './**/0/**/../[01]/**/0/../
**/0/*.txt' ---
~~ sync ~~
node fast-glob sync
0m0.484s  0
node globby sync
0m0.507s  0
node current globSync mjs
0m0.577s  4880
node current glob syncStream
0m0.586s  4880
~~ async ~~
node fast-glob async
0m0.280s  0
node globby async
0m0.298s  0
node current glob async mjs
0m0.327s  4880
node current glob stream
0m0.324s  4880

--- pattern: '**/????/????/????/????/
*.txt' ---
~~ sync ~~
```



## hasMagic(pattern: string | string[], options?: GlobOptions) => boolean

Returns `true` if the provided pattern contains any “magic” glob characters, given the options provided.

Brace expansion is not considered “magic” unless the `magicalBraces` option is set, as brace expansion just turns one string into an array of strings. So a pattern like `'x{a,b}y'` would return `false`, because `'xay'` and `'xby'` both do not contain any magic glob characters, and it’s treated the same as if you had called it on `['xay', 'xby']`. When `magicalBraces:true` is in the options, brace expansion *is* treated as a pattern having magic.

## escape(pattern: string, options?: GlobOptions) => string

Escape all magic characters in a glob pattern, so that it will only ever match literal strings

If the `windowsPathsNoEscape` option is used, then characters are escaped by wrapping in `[]`, because a magic character wrapped in a character class can only be satisfied by that exact character.

Slashes (and backslashes in `windowsPathsNoEscape` mode) cannot be escaped or unescaped.

### `unescape(pattern: string, options?: GlobOptions) => string`

Un-escape a glob string that may contain some escaped characters.

If the `windowsPathsNoEscape` option is used, then square-brace escapes are removed, but not backslash escapes. For example, it will turn the string `'[*]'` into `*`, but it will not turn `'\\*'` into `'*'`, because `\` is a path separator in `windowsPathsNoEscape` mode.

When `windowsPathsNoEscape` is not set, then both brace escapes and backslash escapes are removed.

Slashes (and backslashes in `windowsPathsNoEscape` mode) cannot be escaped or unescaped.

## Class `Glob`

An object that can perform glob pattern traversals.



```
node globby async
0m0.509s  200023
node current glob async mjs
0m0.427s  200023
node current glob stream
0m0.388s  200023

--- pattern: '{**/*.txt,**/?/**/
*.txt,**/?/**/?/**/*.txt,**/?/**/?/**/?/
**/*.txt,**/?/**/?/**/?/**/?/**/*.txt}'
---
~~ sync ~~
node fast-glob sync
0m0.589s  200023
node globby sync
0m0.771s  200023
node current globSync mjs
0m0.716s  200023
node current glob syncStream
0m0.684s  200023
~~ async ~~
node fast-glob async
0m0.351s  200023
node globby async
0m0.518s  200023
node current glob async mjs
0m0.462s  200023
node current glob stream
0m0.468s  200023

--- pattern: '**/5555/0000/*.txt' ---
~~ sync ~~
node fast-glob sync
0m0.496s  1000
node globby sync
0m0.519s  1000
node current globSync mjs
```

```
0m0.306s  160
node current glob stream
0m0.322s  160

--- pattern: './**/0/**/0/**/*.txt' ---
~~ sync ~~
node fast-glob sync
0m0.502s  5230
node globby sync
0m0.527s  5230
node current globSync mjs
0m0.544s  5230
node current glob syncStream
0m0.557s  5230
~~ async ~~
node fast-glob async
0m0.285s  5230
node globby async
0m0.305s  5230
node current glob async mjs
0m0.304s  5230
node current glob stream
0m0.310s  5230

--- pattern: '**/*.txt' ---
~~ sync ~~
node fast-glob sync
0m0.580s  200023
node globby sync
0m0.771s  200023
node current globSync mjs
0m0.685s  200023
node current glob syncStream
0m0.649s  200023
~~ async ~~
node fast-glob async
0m0.349s  200023
```



```
const g = new Glob(pattern: string
 | string[], options: GlobOptions)
```

Options object is required.

See full options descriptions below.

*[!NOTE] A previous* `Glob` *object can be passed as the* `GlobOptions` *to another* `Glob` *instantiation to re-use settings and caches with a new pattern.*

Traversal functions can be called multiple times to run the walk again.

## g.stream()

Stream results asynchronously.

## g.streamSync()

Stream results synchronously.

## g.iterate()

Default async iteration function. Returns an AsyncGenerator that iterates over the results.

### g.iterateSync()

Default sync iteration function. Returns a Generator that iterates over the results.

### g.walk()

Returns a Promise that resolves to the results array.

### g.walkSync()

Returns a results array.

## Properties

All options are stored as properties on the `Glob` object.

- `opts` The options provided to the constructor.
- `patterns` An array of parsed immutable `Pattern` objects.



```
*.txt' ---
~~ sync ~~
node fast-glob sync
0m0.490s  10
node globby sync
0m0.517s  10
node current globSync mjs
0m0.540s  10
node current glob syncStream
0m0.550s  10
~~ async ~~
node fast-glob async
0m0.290s  10
node globby async
0m0.296s  10
node current glob async mjs
0m0.278s  10
node current glob stream
0m0.302s  10

--- pattern: './**/[01]/**/[12]/**/[23]/
**/[45]/**/*.txt' ---
~~ sync ~~
node fast-glob sync
0m0.500s  160
node globby sync
0m0.528s  160
node current globSync mjs
0m0.556s  160
node current glob syncStream
0m0.573s  160
~~ async ~~
node fast-glob async
0m0.283s  160
node globby async
0m0.301s  160
node current glob async mjs
```

```
node globby sync
0m0.765s  200364
node current globSync mjs
0m0.683s  222656
node current glob syncStream
0m0.649s  222656
~~ async ~~
node fast-glob async
0m0.350s  200364
node globby async
0m0.509s  200364
node current glob async mjs
0m0.463s  222656
node current glob stream
0m0.411s  222656

--- pattern: '**/..' ---
~~ sync ~~
node fast-glob sync
0m0.486s  0
node globby sync
0m0.769s  200364
node current globSync mjs
0m0.564s  2242
node current glob syncStream
0m0.583s  2242
~~ async ~~
node fast-glob async
0m0.283s  0
node globby async
0m0.512s  200364
node current glob async mjs
0m0.299s  2242
node current glob stream
0m0.312s  2242

--- pattern: './**/0/**/0/**/0/**/0/**/
```



# Options

Exported as `GlobOptions` TypeScript interface. A `GlobOptions` object may be provided to any of the exported methods, and must be provided to the `Glob` constructor.

All options are optional, boolean, and false by default, unless otherwise noted.

All resolved options are added to the Glob object as properties.

If you are running many `glob` operations, you can pass a Glob object as the `options` argument to a subsequent operation to share the previously loaded cache.

- `cwd` String path or `file://` string or URL object. The current working directory in which to search. Defaults to `process.cwd()`. See also: “Windows, CWDs, Drive Letters, and UNC Paths”, below.

  This option may be either a string path or a `file://` URL object or string.
- `root` A string path resolved against the `cwd` option, which is used as the starting point for absolute patterns that start with `/`, (but not drive letters or UNC paths on Windows).

  To start absolute and non-absolute patterns in the same path, you can use `{root:''}`. However, be aware that on Windows systems, a pattern like `x:/*` or `//host/share/*` will *always* start in the `x:/` or `//host/share` directory, regardless of the `root` setting.

*[!NOTE] This doesn't necessarily limit the walk to the* `root` *directory, and doesn't affect the cwd starting point for non-absolute patterns. A pattern containing* `..` *will still be able to traverse out of the root directory, if it is not an actual root directory on the filesystem, and any non-absolute patterns will be matched in the* `cwd`*. For example, the pattern* `/../*` *with* `{root:'/some/path'}` *will return all files in* `/some`*, not all files in* `/some/path`*. The pattern* `*` *with* `{root:'/some/path'}` *will return all the entries in the cwd, not the entries in* `/some/path`*.*

- `windowsPathsNoEscape` Use `\\` as a path separator *only*, and *never* as an escape character. If set, all `\\` characters are replaced with `/` in the pattern.

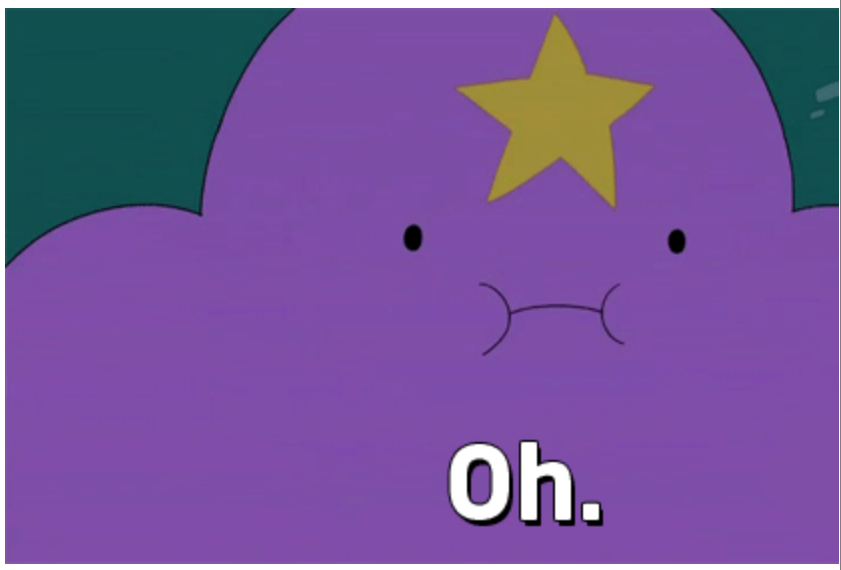
  *[!NOTE] This makes it* ***impossible*** *to match against paths containing literal glob pattern characters, but allows matching with patterns constructed using* `path.join()` *and* `path.resolve()` *on Windows platforms, mimicking the (buggy!) behavior of Glob v7 and before on Windows. Please use with caution, and be mindful of [the caveat below about Windows paths](). (For legacy reasons, this is also set if*



*were designed with APIs that are extremely dated by current JavaScript standards.*

---

[1]: In the cases where this module returns results and `fast-glob` doesn't, it's even faster, of course.




lumpy space princess saying 'oh my GLOB'

## Benchmark Results

The first number is time, smaller is better.

The second number is the count of results returned.

```
--- pattern: '**' ---
~~ sync ~~
node fast-glob sync
0m0.598s  200364
```

In my testing, `fast-glob` is around 10-20% faster than this module when walking over 200k files nested 4 directories deep[1]. However, there are some inconsistencies with Bash matching behavior that this module does not suffer from:

- `**` only matches files, not directories
- `..` path portions are not handled unless they appear at the start of the pattern
- `./!(<pattern>)` will not match any files that *start* with `<pattern>`, even if they do not match `<pattern>`. For example, `!(9).txt` will not match `9999.txt`.
- Some brace patterns in the middle of a pattern will result in failing to find certain matches.
- Extglob patterns are allowed to contain `/` characters.

Globby exhibits all of the same pattern semantics as fast-glob, (as it is a wrapper around fast-glob) and is slightly slower than node-glob (by about 10-20% in the benchmark test set, or in other words, anywhere from 20-50% slower than fast-glob). However, it adds some API conveniences that may be worth the costs.

- Support for `.gitignore` and other ignore files.
- Support for negated globs (ie, patterns starting with `!` rather than using a separate `ignore` option).

The priority of this module is "correctness" in the sense of performing a glob pattern expansion as faithfully as possible to the behavior of Bash and other sh-like shells, with as much speed as possible.

*[!NOTE] Prior versions of* `node-glob` *are not on this list. Former versions of this module are far too slow for any cases where performance matters at all, and*



`allowWindowsEscape` *is set to the exact value* `false`*.)*

- `dot` Include `.dot` files in normal matches and `globstar` matches. Note that an explicit dot in a portion of the pattern will always match dot files.
- `magicalBraces` Treat brace expansion like `{a,b}` as a "magic" pattern. Has no effect if {@link nobrace} is set.

  Only has effect on the {@link hasMagic} function, no effect on glob pattern matching itself.
- `dotRelative` Prepend all relative path strings with `./` (or `.\` on Windows).

  Without this option, returned relative paths are "bare", so instead of returning `'./foo/bar'`, they are returned as `'foo/bar'`.

  Relative patterns starting with `'../'` are not prepended with `./`, even if this option is set.
- `mark` Add a `/` character to directory matches. Note that this requires additional stat calls.
- `nobrace` Do not expand `{a,b}` and `{1..3}` brace sets.
- `noglobstar` Do not match `**` against multiple filenames. (Ie, treat it as a normal `*` instead.)
- `noext` Do not match "extglob" patterns such as `+(a|b)`.
- `nocase` Perform a case-insensitive match. This defaults to `true` on macOS and Windows systems, and `false` on all others.

*[!NOTE]* `nocase` *should only be explicitly set when it is known that the filesystem's case sensitivity differs from the platform default. If set* `true` *on case-sensitive*

*file systems, or* `false` *on case-insensitive file systems, then the walk may return more or less results than expected.*

- `maxDepth` Specify a number to limit the depth of the directory traversal to this many levels below the `cwd`.
- `matchBase` Perform a basename-only match if the pattern does not contain any slash characters. That is, `*.js` would be treated as equivalent to `**/*.js`, matching all js files in all directories.
- `nodir` Do not match directories, only files. (Note: to match *only* directories, put a `/` at the end of the pattern.)

*[!NOTE] When* `follow` *and* `nodir` *are both set, then symbolic links to directories are also omitted.*

- `stat` Call `lstat()` on all entries, whether required or not to determine whether it's a valid match. When used with `withFileTypes`, this means that matches will include data such as modified time, permissions, and so on. Note that this will incur a performance cost due to the added system calls.
- `ignore` string or string[], or an object with `ignored` and `childrenIgnored` methods.

  If a string or string[] is provided, then this is treated as a glob pattern or array of glob patterns to exclude from matches. To ignore all children within a directory, as well as the entry itself, append `'/**'` to the ignore pattern.

  If an object is provided that has `ignored(path)` and/or `childrenIgnored(path)` methods, then these methods will



# Comparison to Other JavaScript Glob Implementations

**tl;dr**

- If you want glob matching that is as faithful as possible to Bash pattern expansion semantics, and as fast as possible within that constraint, *use this module*.
- If you are reasonably sure that the patterns you will encounter are relatively simple, and want the absolutely fastest glob matcher out there, *use fast-glob*.
- If you are reasonably sure that the patterns you will encounter are relatively simple, and want the convenience of automatically respecting `.gitignore` files, *use globby*.

There are some other glob matcher libraries on npm, but these three are (in my opinion, as of 2023) the best.

---

**full explanation**

Every library reflects a set of opinions and priorities in the trade-offs it makes. Other than this library, I can personally recommend both globby and fast-glob, though they differ in their benefits and drawbacks.

Both have very nice APIs and are reasonably fast.

`fast-glob` is, as far as I am aware, the fastest glob implementation in JavaScript today. However, there are many cases where the choices that `fast-glob` makes in pursuit of speed mean that its results differ from the results returned by Bash and other sh-like shells, which may be surprising.

# Glob Logo

Glob's logo was created by Tanya Brassie. Logo files can be found here.

The logo is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License.

# Contributing

Any change to behavior (including bugfixes) must come with a test.

Patches that fail tests or reduce performance will be rejected.

```
# to run tests
npm test

# to re-generate test fixtures
npm run test-regen

# run the benchmarks
npm run bench

# to profile javascript
npm run prof
```



be called to determine whether any Path is a match or if its children should be traversed, respectively.

The `path` argument to the methods will be a `path-scurry` `Path` object, which extends `fs.Dirent` with additional useful methods like `.fullpath()`, `.relative()`, and more.

*[!NOTE]* `ignore` *patterns are always in* `dot:true` *mode, regardless of any other settings.*

- `follow` Follow symlinked directories when expanding `**` patterns. This can result in a lot of duplicate references in the presence of cyclic links, and make performance quite bad.

  By default, a `**` in a pattern will follow 1 symbolic link if it is not the first item in the pattern, or none if it is the first item in the pattern, following the same behavior as Bash.

  *[!NOTE] When* `follow` *and* `nodir` *are both set, then symbolic links to directories are also omitted.*

- `realpath` Set to true to call `fs.realpath` on all of the results. In the case of an entry that cannot be resolved, the entry is omitted. This incurs a slight performance penalty, of course, because of the added system calls.
- `absolute` Set to true to always receive absolute paths for matched files. Set to `false` to always receive relative paths for matched files.

  By default, when this option is not set, absolute paths are returned for patterns that are absolute, and otherwise paths are returned that are relative to the `cwd` setting.

This does *not* make an extra system call to get the realpath, it only does string path resolution.

`absolute` may not be used along with `withFileTypes`.

- `posix` Set to true to use `/` as the path separator in returned results. On POSIX systems, this has no effect. On Windows systems, this will return `/` delimited path results, and absolute paths will be returned in their fully resolved UNC path form, e.g. instead of `'C:\\foo\\bar'`, it will return `//?/C:/foo/bar`.
- `platform` Defaults to the value of `process.platform` if available, or `'linux'` if not. Setting `platform:'win32'` on non-Windows systems may cause strange behavior.
- `withFileTypes` Return `path-scurry` `Path` objects instead of strings. These are similar to a NodeJS `fs.Dirent` object, but with additional methods and properties.

  `withFileTypes` may not be used along with `absolute`.
- `signal` An AbortSignal which will cancel the Glob walk when triggered.
- `fs` An override object to pass in custom filesystem methods. See `path-scurry docs` for what can be overridden.
- `scurry` A `PathScurry` object used to traverse the file system. If the `nocase` option is set explicitly, then any provided `scurry` object must match this setting.
- `includeChildMatches` boolean, default `true`. Do not match any children of any matches. For example, the pattern `**\/foo` would match `a/foo`, but not `a/foo/b/foo` in this mode.



as the `cwd` option. (That is, it is the result of `path.resolve('/')`.)

# Race Conditions

Glob searching, by its very nature, is susceptible to race conditions, since it relies on directory walking.

As a result, it is possible that a file that exists when glob looks for it may have been deleted or modified by the time it returns the result.

By design, this implementation caches all readdir calls that it makes, in order to cut down on system overhead. However, this also makes it even more susceptible to races, especially if the cache object is reused between glob calls.

Users are thus advised not to use a glob result as a guarantee of filesystem state in the face of rapid changes. For the vast majority of operations, this is never a problem.

## See Also:

- `man sh`
- `man bash` Pattern Matching
- `man 3 fnmatch`
- `man 5 gitignore`
- minimatch documentation

## Windows, CWDs, Drive Letters, and UNC Paths

On POSIX systems, when a pattern starts with `/`, any `cwd` option is ignored, and the traversal starts at `/`, plus any non-magic path portions specified in the pattern.

On Windows systems, the behavior is similar, but the concept of an "absolute path" is somewhat more involved.

### UNC Paths

A UNC path may be used as the start of a pattern on Windows platforms. For example, a pattern like: `//?/x:/*` will return all file entries in the root of the `x:` drive. A pattern like `//ComputerName/Share/*` will return all files in the associated share.

UNC path roots are always compared case insensitively.

### Drive Letters

A pattern starting with a drive letter, like `c:/*`, will search in that drive, regardless of any `cwd` option provided.

If the pattern starts with `/`, and is not a UNC path, and there is an explicit `cwd` option set with a drive letter, then the drive letter in the `cwd` is used as the root of the directory traversal.

For example, `glob('/tmp', { cwd: 'c:/any/thing' })` will return `['c:/tmp']` as the result.

If an explicit `cwd` option is not provided, and the pattern starts with `/`, then the traversal will run on the root of the drive provided



This is especially useful for cases like "find all `node_modules` folders, but not the ones in `node_modules`".

In order to support this, the `Ignore` implementation must support an `add(pattern: string)` method. If using the default `Ignore` class, then this is fine, but if this is set to `false`, and a custom `Ignore` is provided that does not have an `add()` method, then it will throw an error.

For example:

```
const results = await glob(
[
  // likely to match first, since it's
       just a stat
  'a/b/c/d/e/f',

  // this pattern is more complicated! It
       must to various readdir()
  // calls and test the results against a
       regular expression, and that
  // is certainly going to take a little
       bit longer.
  //
  // So, later on, it encounters a match
       at 'a/b/c/d/e', but it's too
  // late to ignore a/b/c/d/e/f, because
       it's already been emitted.
  'a/[bdf]/?/[a-z]/*',
],
{ includeChildMatches: false },
)
```

It's best to only set this to `false` if you can be reasonably sure that no components of the pattern will potentially match one another's file system descendants, or if the occasional included child entry will not cause problems.

*[!NOTE] It only ignores matches that would be a descendant of a previous match, and only if that descendant is matched after the ancestor is encountered. Since the file system walk happens in indeterminate order, it's possible that a match will already be added before its ancestor, if multiple or braced patterns are used.*

# Glob Primer

Much more information about glob pattern expansion can be found by running `man bash` and searching for `Pattern Matching`.

"Globs" are the patterns you type when you do stuff like `ls *.js` on the command line, or put `build/*` in a `.gitignore` file.

Before parsing the path part patterns, braced sections are expanded into a set. Braced sections start with `{` and end with `}`, with 2 or more comma-delimited sections within. Braced sections may contain slash characters, so `a{/b/c,bcd}` would expand into `a/b/c` and `abcd`.



## Comments and Negation

Previously, this module let you mark a pattern as a "comment" if it started with a `#` character, or a "negated" pattern if it started with a `!` character.

These options were deprecated in version 5, and removed in version 6.

To specify things that should not match, use the `ignore` option.

# Windows

**Please only use forward-slashes in glob expressions.**

Though Windows uses either `/` or `\` as its path separator, only `/` characters are used by this glob implementation. You must use forward-slashes **only** in glob expressions. Back-slashes will always be interpreted as escape characters, not path separators.

Results from absolute patterns such as `/foo/*` are mounted onto the root setting using `path.join`. On Windows, this will by default result in `/foo/*` matching `C:\foo\bar.txt`.

To automatically coerce all `\` characters to `/` in pattern strings, **thus making it impossible to escape literal glob characters**, you may set the `windowsPathsNoEscape` option to `true`.

*subsequent portions of the pattern. This prevents infinite loops and duplicates and the like. You can force glob to traverse symlinks with `**` by setting `{follow:true}` in the options.*

There is no equivalent of the `nonull` option. A pattern that does not find any matches simply resolves to nothing. (An empty array, immediately ended stream, etc.)

If brace expansion is not disabled, then it is performed before any other interpretation of the glob pattern. Thus, a pattern like `+(a|{b),c)}`, which would not be valid in bash or zsh, is expanded **first** into the set of `+(a|b)` and `+(a|c)`, and those patterns are checked for validity. Since those two are valid, matching proceeds.

The character class patterns `[:class:]` (POSIX standard named classes) style class patterns are supported and Unicode-aware, but `[=c=]` (locale-specific character collation weight), and `[.symbol.]` (collating symbol), are not.

## Repeated Slashes

Unlike Bash and zsh, repeated `/` are always coalesced into a single path separator.



The following characters have special magic meaning when used in a path portion. With the exception of `**`, none of these match path separators (ie, `/` on all platforms, and `\` on Windows).

- `*` Matches 0 or more characters in a single path portion. When alone in a path portion, it must match at least 1 character. If `dot:true` is not specified, then `*` will not match against a `.` character at the start of a path portion.
- `?` Matches 1 character. If `dot:true` is not specified, then `?` will not match against a `.` character at the start of a path portion.
- `[...]` Matches a range of characters, similar to a RegExp range. If the first character of the range is `!` or `^` then it matches any character not in the range. If the first character is `]`, then it will be considered the same as `\]`, rather than the end of the character class.
- `!(pattern|pattern|pattern)` Matches anything that does not match any of the patterns provided. May *not* contain `/` characters. Similar to `*`, if alone in a path portion, then the path portion must have at least one character.
- `?(pattern|pattern|pattern)` Matches zero or one occurrence of the patterns provided. May *not* contain `/` characters.
- `+(pattern|pattern|pattern)` Matches one or more occurrences of the patterns provided. May *not* contain `/` characters.
- `*(a|b|c)` Matches zero or more occurrences of the patterns provided. May *not* contain `/` characters.
- `@(pattern|pat*|pat?erN)` Matches exactly one of the patterns provided. May *not* contain `/` characters.

- `**` If a “globstar” is alone in a path portion, then it matches zero or more directories and subdirectories searching for matches. It does not crawl symlinked directories, unless `{follow:true}` is passed in the options object. A pattern like `a/b/**` will only match `a/b` if it is a directory. Follows 1 symbolic link if not the first item in the pattern, or 0 if it is the first item, unless `follow:true` is set, in which case it follows all symbolic links.

  `[:class:]` patterns are supported by this implementation, but `[=c=]` and `[.symbol.]` style class patterns are not.

## Dots

If a file or directory path portion has a `.` as the first character, then it will not match any glob pattern unless that pattern’s corresponding path part also has a `.` as its first character.

For example, the pattern `a/.*/c` would match the file at `a/.b/c`. However the pattern `a/*/c` would not, because `*` does not start with a dot character.

You can make glob treat dots as normal characters by setting `dot:true` in the options.

## Basename Matching

If you set `matchBase:true` in the options, and the pattern has no slashes in it, then it will seek for any file anywhere in the



tree with a matching basename. For example, `*.js` would match `test/simple/basic.js`.

## Empty Sets

If no matching files are found, then an empty array is returned. This differs from the shell, where the pattern itself is returned. For example:

```
$ echo a*s*d*f
a*s*d*f
```

# Comparisons to other fnmatch/glob implementations

While strict compliance with the existing standards is a worthwhile goal, some discrepancies exist between node-glob and other implementations, and are intentional.

The double-star character `**` is supported by default, unless the `noglobstar` flag is set. This is supported in the manner of bsdglob and bash 5, where `**` only has special significance if it is the only thing in a path part. That is, `a/**/b` will match `a/x/y/b`, but `a/**b` will not.

*[!NOTE] Symlinked directories are not traversed as part of a `**`, though their contents may match against*