# Bun JS runtime and toolkit

## CONCEPTS

Bun is one binary: runtime, package manager, test runner and bundler. It runs TypeScript and JSX directly, no build step.

**package.json** declared ranges
↓ `bun install`
**bun.lock** pinned versions
↓ fetch + link
**node_modules** global cache
↓ `bun run / test`
**Your code** TS, JSX, JS

Put Bun flags right after bun: 'bun --watch run dev'. After the script name they go to the script.

Dependency lifecycle scripts (postinstall) are blocked unless the package is in trustedDependencies.

## INSTALL AND ADD

`bun install`
Install all dependencies

`bun add <pkg>`
Add a dependency

`bun add <pkg>@<version>`
Add a specific version or tag

`bun add -d <pkg>`
Add a dev dependency

`bun add --exact <pkg>`
Pin the exact version

`bun add github:<user>/<repo>`
Add from a GitHub repo

`bun add -g <pkg>`
Install a CLI tool globally

`bun install --frozen-lockfile`
Fail if lockfile is out of date

`bun ci`
Same as install --frozen-lockfile

`bun install --production`
Skip devDependencies

`bun install --filter <pattern>`
Install only for matching workspaces

`bun install --ignore-scripts`
Skip all lifecycle scripts

## REMOVE AND UPDATE

`bun remove <pkg>`
Remove a dependency

`bun update`
Update within package.json ranges

`bun update <pkg>`
Update one package

`bun update --latest`
Ignore ranges, take latest

`bun update -i`
Pick updates interactively

`bun outdated`
Show packages with newer versions

`bun audit`
Check for known vulnerabilities

## RUN AND WATCH

`bun <file>`
Run a TS, JS or JSX file

`bun run <script>`
Run a package.json script

`bun run`
List available scripts

`bun --watch <file>`
Restart on file change

`bun --hot <file>`
Reload in place, keep state

`bun --env-file=<file> <file>`
Load a specific .env file

`bun run --bun <bin>`
Run a Node-shebang binary with Bun

`bunx <pkg>`
Run a package binary without installing

`bunx <pkg>@<version>`
Run a specific version

`bunx -p <pkg> <bin>`
Binary name differs from package

`bunx --bun <pkg>`
Run with Bun instead of Node

## TEST

`bun test`
Run all tests

`bun test <path>`
Run files matching a path filter

## TEST (cont.)

`bun test -t '<regex>'`
Run tests by name pattern

`bun test --watch`
Re-run on file change

`bun test --coverage`
Print a coverage report

`bun test --bail`
Stop at the first failure

`bun test --timeout <ms>`
Set per-test timeout

`bun test -u`
Update snapshots

## BUILD AND SCAFFOLD

`bun init -y`
Scaffold with default answers

`bun build <entry> --outdir <dir>`
Bundle to a directory

`bun build <entry> --outfile <file>`
Bundle to one file

`bun build <entry> --compile --outfile <name>`
Make a standalone executable

`bun build <entry> --target <env>`
Target browser, bun or node

`bun build <entry> --minify`
Minify the output

`bun build <entry> --sourcemap=linked`
Emit source maps

## WORKSPACES AND PACKAGES

`bun run --filter '<pattern>' <script>`
Run a script in matching workspaces

`bun run --workspaces <script>`
Run a script in all workspaces

`bun add <pkg> --filter <workspace>`
Add a dependency to one workspace

`bun why <pkg>`
Explain why a package is installed