Ruff Python lint and format

CONCEPTS

Two tools in one binary: check lints (and fixes), format rewrites layout. Run both; they do not overlap.

Config pyproject.toml / ruff.toml
↓ `select rules`
ruff check violations
↓ `--fix`
ruff format layout
↓ `--check in CI`
Clean tree commit

Since 0.17 the default is a broad curated set (F, E4/E7/E9, B, UP, SIM, RUF, PL and more). See it with ruff check --show-settings --isolated; select replaces it, extend-select adds.

CHECK

`ruff check`
Lint current directory

`ruff check` *`<path>`*`...`
Lint given files or dirs

`ruff check --fix`
Apply safe fixes

`ruff check --diff`
Preview fixes as a diff

`ruff check --unsafe-fixes --fix`
Also apply unsafe fixes

`ruff check --show-fixes`
List what was fixed

`ruff check --watch`
Re-run on file changes

`ruff check --exit-non-zero-on-fix`
Fail if fixes were applied

FORMAT

`ruff format`
Format current directory

`ruff format` *`<path>`*`...`
Format given files or dirs

`ruff format --check`
Fail if anything would change

`ruff format --diff`
Show changes, write nothing

FORMAT (cont.)

`ruff format --line-length` *`<n>`*
Override line length

Format suppression comments

Comment	Effect
`# fmt: off / # fmt: on`	skip a region
`# fmt: skip`	skip one statement

RULE SELECTION

`--select` *`<codes>`*
Enable only these rules

`--extend-select` *`<codes>`*
Add rules to the current set

`--ignore` *`<codes>`*
Disable rules

`--select ALL`
Enable every rule

`--per-file-ignores` *`<glob>`*`:`*`<code>`*
Ignore rules per path

`--target-version` *`<py3xx>`*
Minimum Python to assume

`--statistics`
Count violations per rule

`ruff check --select I --fix`
Sort imports (isort rules)

`ruff check --select UP --fix`
Modernise syntax (pyupgrade)

Popular rule prefixes

Prefix	From
`E / W`	pycodestyle
`F`	Pyflakes
`I`	isort
`B`	bugbear
`UP`	pyupgrade
`SIM`	simplify
`N`	pep8-naming
`C4`	comprehensions

SUPPRESSING

`# noqa:` *`<code>`*
Ignore a rule on this line

`# noqa`
Ignore all rules on this line

`# ruff: noqa:` *`<code>`*
Ignore a rule for the file

`ruff check --add-noqa`
Insert noqa for all hits

EXPLORE

`ruff rule` *`<code>`*
Explain one rule

`ruff config`
List all settings

`ruff config` *`<option>`*
Describe one setting

OUTPUT AND FILES

`--output-format` *`<fmt>`*
Choose report format

`--exclude` *`<pattern>`*
Replace excluded paths

`--extend-exclude` *`<pattern>`*
Exclude more paths

`--config` *`<file|key=value>`*
Use a file or override a setting

CONFIG

pyproject.toml basics

```
[tool.ruff]
line-length = 100
target-version = "py312"
extend-exclude = ["migrations"]

[tool.ruff.lint]
select = ["E4", "E7", "E9", "F",
"I", "B"]
ignore = ["B008"]
```

Per-file ignores

```
[tool.ruff.lint.per-file-ignores]
"tests/**" = ["S101"]
"__init__.py" = ["F401"]
```

Formatter options

```
[tool.ruff.format]
quote-style = "double"
indent-style = "space"
docstring-code-format = true
```

EDITORS AND CI

pre-commit hook

```
repos:
- repo: https://github.com/astral-
sh/ruff-pre-commit
  rev: <tag>
  hooks:
  - id: ruff-check
    args: [--fix]
  - id: ruff-format
```

GitHub Actions step

```
- run: pip install ruff
- run: ruff check --output-
format=github
- run: ruff format --check
```