pytest Python test runner

Collect find tests → `filter -k -m` → **Setup** fixtures → `run` → **Call** test body → `teardown` → **Report** pass / fail

CONCEPTS

Files named test_*.py or *_test.py, functions named test_*, are collected; plain assert is all you need.

Fixtures in conftest.py are shared with every test below that directory, with no import.

SELECT TESTS

`pytest <dir> / <file.py>`
Run a directory or file

`pytest <file.py>::<test>`
Run one test function

`pytest <file.py>::<Class>::<method>`
Run one method of a class

`pytest "<file.py>::<test>[<id>]"`
Run one parametrized case

`pytest -k "a and not b"`
Select by name expression

`pytest -m <marker>`
Select by marker

`pytest -m "not slow"`
Skip a marker

RUN CONTROL

`pytest -x`
Stop at first failure

RUN CONTROL (cont.)

`pytest --lf`
Rerun only last failures

`pytest --ff`
Failures first, then the rest

`pytest --durations=<n>`
Show n slowest tests

OUTPUT

`pytest -v / -vv`
More detail per test

`pytest -s`
Do not capture stdout

`pytest --tb=short`
Compact tracebacks

`pytest -l`
Show locals in tracebacks

`pytest -ra`
Summary of all but passed

DEBUGGING

`pytest --pdb`
Open pdb at a failure

`breakpoint()`
Drop into the debugger here

`pytest --setup-show`
Show fixture setup and teardown

`pytest --fixtures`
List available fixtures

FIXTURES

`@pytest.fixture`
Declare a fixture

`def test_x(<fixture>):`
Request a fixture by argument name

`yield <value>`
Setup before, teardown after

`@pytest.fixture(scope="<s>")`
Share across tests

`@pytest.fixture(autouse=True)`
Apply to every test in scope

`@pytest.fixture(params=<list>)`
Run tests once per value

`conftest.py`
Directory-wide shared fixtures

Fixture with teardown

```
@pytest.fixture
def db():
    conn = connect()
    yield conn
    conn.close()
```

PARAMETRIZE AND MARKS

`@pytest.mark.parametrize("a,b", [(1, 2), (3, 4)])`
Run a test per data row

PARAMETRIZE AND MARKS (cont.)

`@pytest.mark.skip`
Always skip (reason="<why>")

`@pytest.mark.skipif(<cond>)`
Skip on a condition (add reason=)

`@pytest.mark.xfail`
Expected to fail (reason="<why>")

ASSERTIONS AND BUILT-INS

`assert <expr>`
Plain assert with rich diffs

`with pytest.raises(<Exc>):`
Expect an exception

`pytest.raises(<Exc>, match="<re>")`
Check the message by regex

`pytest.approx(<x>)`
Compare floats with tolerance

`tmp_path`
Temporary directory per test

`monkeypatch`
Patch attrs, env, dicts

ASSERTIONS AND BUILT-INS (cont.)

`capsys`
Capture stdout and stderr

`monkeypatch.setattr(<obj>, "<name>", <val>)`
Replace an attribute

CONFIG

`[tool.pytest]`
pyproject table (pytest 9+)

`testpaths = ["tests"]`
Where to look by default

`addopts = ["-ra", "-q"]`
Options added to every run

`markers = ["slow: slow tests"]`
Register custom markers

`--strict-markers`
Error on unregistered markers

RECIPES

Table-driven test

```
@pytest.mark.parametrize("s, n", [
    ("1", 1),
    (" 2 ", 2),
    pytest.param("x", 0, id="bad"),
])
def test_parse(s, n):
    assert parse(s) == n
```