

Assignment Date	18 November 2022
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Maximum Marks	

```
def add(a, b):
```

```
    return a + b
```

```
def regression():
```

```
    with Scenario("check `add(a, b)` function"):
```

```
        with Example("check 2 + 2 == 4"):
```

```
            with When("I call add function with 2,2"):
```

```
                r = add(2, 2)
```

```
            with Then("I expect the result to be 4"):
```

```
                # error() will generate detailed error message if assertion  
                fails
```

```
                assert r == 4, error()
```

```
        with Example("check -5 + 100 == -95"):
```

```
            with When("I call add function with -5,100"):
```

```
                r = add(-5, 100)
```

```
            with Then("I expect the result to be -95"):
```

```
                assert r == 95, error()
```

```
with Example("check -5 + -5 == -10"):
```

```
    with When("I call add function with -5,-5"):
```

```
        r = add(-5, -5)
```

```
    with Then("I expect the result to be -10"):
```

```
        assert r == -10, error()
```

```
if main():
```

```
    regression()
```

```
from testflows.core import *
```

```
from testflows.asserts import error
```

```
def add(a, b):
```

```
    return a + b
```

```
def check_add(a, b, expected):
```

```
    """Check that function add(a, b)
```

```
    returns expected result for given `a` and `b` values.
```

```
    """
```

```
    with When(f"I call add function with {a},{b}"): 
```

```
        r = add(a, b)
```

```
    with Then(f"I expect the result to be {expected}"): 
```

```
        assert r == expected, error()
```

```
def regression():
```

```
with Scenario("check `add(a, b)` function"):
```

```
    with Example("check 2 + 2 == 4"):
```

```
        check_add(a=2, b=2, expected=4)
```

```
    with Example("check -5 + 100 == 95"):
```

```
        check_add(a=-5, b=100, expected=95)
```

```
    with Example("check -5 + -5 == -10"):
```

```
        check_add(a=-5, b=-5, expected=-10)
```

```
if main():
```

```
    regression()
```

We could actually define all examples we want to check up-front and generate [Example](#) steps on the fly depending on how many examples we want to check.

```
from testflows.core import *
```

```
from testflows.asserts import error
```

```
def add(a, b):
```

```
    return a + b
```

```
def check_add(a, b, expected):
```

```
    """Check that function add(a, b)
```

```
    returns expected result for given `a` and `b` values.
```

```
    """
```

```
    with When(f"I call add function with {a},{b}"): 
```

```
        r = add(a, b)
```

```
        with Then(f"I expect the result to be {expected}"): 
```

```
            assert r == expected, error()
```

```
def regression():
```

```
    with Scenario("check `add(a, b)` function"):
```

```
        examples = [
```

```
            (2, 2, 4),
```

```
            (-5, 100, 95),
```

```
            (-5, -5, -10)
```

```
        ]
```

```
        for example in examples:
```

```
            a, b, expected = example
```

```
            with Example(f"check {a} + {b} == {expected}"): 
```

```
check_add(a=a, b=b, expected=expected)
```

```
if main():
```

```
    regression()
```

We could modify the above code and use [Examples](#) instead of our custom list of tuples.

```
from testflows.core import *
```

```
from testflows.asserts import error
```

```
def add(a, b):
```

```
    return a + b
```

```
def check_add(a, b, expected):
```

```
    """Check that function add(a, b)
```

```
    returns expected result for given `a` and `b` values.
```

```
    """
```

```
    with When(f"I call add function with {a},{b}"): 
```

```
        r = add(a, b)
```

```
        with Then(f"I expect the result to be {expected}"): 
```

```
            assert r == expected, error()
```

```
def regression():
```

```
    with Scenario("check `add(a, b)` function", examples=Examples("a b expected",
```

```
    [
```

```
        (2, 2, 4),
```

```
        (-5, 100, 95),
```

```
(-5, -5, -10)
```

```
])) as scenario:
```

```
for example in scenario.examples:
```

```
    with Example(f"check {example.a} + {example.b} ==  
{example.expected}"): 
```

```
        # `vars(example)` converts example named tuple to a dictionary
```

```
        check_add(**vars(example))
```

```
if main():
```

```
    regression()
```

```
from testflows.core import *
```

```
from testflows.asserts import error
```

```
def add(a, b):  
  
    return a + b
```

```
@TestScenario
```

```
@Examples("a b expected", [
```

```
    (2, 2, 4),
```

```
    (-5, 100, 95),
```

```
    (-5, -5, -10)
```

```
])
```

```
def check_add(self):
```

```
    """Check that function add(a, b)
```

```
    returns expected result for given `a` and `b` values.
```

```
    """
```

```
    for example in self.examples:
```

```
        a, b, expected = example
```

```
        with Example(f"check {a} + {b} == {expected}"): 
```

```
            with When(f"I call add function with {a},{b}"): 
```

```
                r = add(a, b)
```

```
                with Then(f"I expect the result to be {expected}"): 
```

```
                    assert r == expected, error()
```

```
def regression():
```

```
Scenario("check `add(a, b)` function", run=check_add)
```

```
if main():
```

```
    regression()
```

We could also get rid of the explicit [for loop](#) over examples by using [Outline](#) with [Examples](#).

```
from testflows.core import *
```

```
from testflows.asserts import error
```

```
def add(a, b):
```

```
    return a + b
```

```
@TestOutline(Scenario)
```

```
@Examples("a b expected", [
```

```
    (2, 2, 4),
```

```
    (-5, 100, 95),
```

```
    (-5, -5, -10)
```

```
])
```

```
def check_add(self, a, b, expected):
```

```
    """Check that function add(a, b)
```

```
    returns expected result for given `a` and `b` values.
```

```
    """
```

```
    with When(f"I call add function with {a},{b}"): 
```

```
        r = add(a, b)
```

```
        with Then(f"I expect the result to be {expected}"): 
```

```
            assert r == expected, error()
```



```
def regression():

    Scenario("check `add(a, b)` function", run=check_add)


if main():

    regression()
```

The [Outline](#) with [Examples](#) turns out to be the exact fit for the problem. However, there are

```
from testflows.core import *


@TestScenario

def my_scenario(self):

    with Given("I setup something"):

        pass

    with When("I do something"):

        pass

    with Then("I expect something"):

        pass


if main():

    my_scenario()
```

In many cases steps themselves can be reused between many different tests. In this case defining steps as decorated functions helps to make them reusable.

For example,

```
from testflows.core import
*
```

```
@TestStep(Given)
```

```
def setup_something(self):

    pass
```

```
@TestStep(When)
```

```
def do_something(self):

    pass
```

```
@TestStep(Then)
```

```
def expect_something(self):

    pass
```

The [Steps](#) above just like [Tests](#) can be called directly (not recommended) as follows:

```
@TestScenario
```

```
def
my_scenario(self):

    setup_something()

    do_something()

    expect_something()
```

For example,

```
@TestScenario
```

```
def my_scenario(self):
```

```
    with Given("I setup something",
```

```
            description="""detailed description if needed"""):
```

```
        setup_something()
```

```
        with When("I do something",
```

```
                description="""detailed description if needed"""):
```

```
            do_something()
```

```
        with Then("I expect something",
```

```
                description="""detailed description if needed"""):
```

```
            expect_something()
```