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**Факультет «Информатика и системы управления»  
Кафедра ИУ5 «Системы обработки информации и управления»**

**Курс «Базовые компоненты интернет-технологий»  
Отчет по лабораторной работе №5  
«Модульное тестирование в Python»**

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# Задание

1. Выберите любой фрагмент кода из лабораторных работ 1 или 2 или 3-4.
2. Модифицируйте код таким образом, чтобы он был пригоден для модульного тестирования.
3. Разработайте модульные тесты. В модульных тестах необходимо применить следующие технологии:
  - TDD - фреймворк (не менее 3 тестов).
  - BDD - фреймворк (не менее 3 тестов).
  - Создание Моск-объектов (необязательное дополнительное задание).

## Текст программы

Файлы:

test-tdd.py

```
import unittest
from biqr_mod import get_roots

class SquareEqSolverTestCase(unittest.TestCase):
    def test_no_root(self):
        res = get_roots(1, 11, 10)
        self.assertEqual(len(res), 0)

    def test_single_root(self):
        res = get_roots(10, 0, 0)
        self.assertEqual(len(res), 1)
        self.assertEqual(res, [0])

    def test_two_roots(self):
        res = get_roots(1, -2, -8)
        self.assertEqual(len(res), 2)
        self.assertEqual(res, [2.0, -2.0])

    def test_three_roots(self):
        res = get_roots(-4, 16, 0)
        self.assertEqual(len(res), 1)
        self.assertEqual(res, [0])

    def test_four_roots(self):
        res = get_roots(1, -10, 9)
        self.assertEqual(len(res), 4)
        self.assertEqual(res, [3.0, -3.0, 1.0, -1.0])

if __name__ == '__main__':
    unittest.main()
```

test.feature

Feature: Testing lab\_python\_oop

Scenario Outline: Testing properties of rectangle

Given rectangle with sides of "<first>" and "<second>", color is "<color>" and name is "<name>"

When we try to get properties  
Then we get area of "<area>", color is "<color>" and name is "<name>"

Examples: Rectangle

first	second	name	color	area
9	4	pryamougolnik	blue	45
5	1	pryamougolnik2	red	5
99	98	rEcTaNgLe	yellow	9702

Scenario Outline: Testing properties of circle

Given circle with radius of "<radius>", color is "<color>" and name is "<name>"

When we try to get properties

Then we get area of "<area>", color is "<color>" and name is "<name>"

Examples: Circle

radius	name	color	area
1	krug	cyan	3.141592653589793
12	mega_krug	gray	37.69911184307752
200	super ultra krug	black	348.71678454846705

Scenario Outline: Testing properties of circle

Given square with side of "<side>", color is "<color>" and name is "<name>"

When we try to get properties

Then we get area of "<area>", color is "<color>" and name is "<name>"

Examples: Square

side	name	color	area
1	kvadrat	lime	1
12	kvadratik	pink	144
200	square shape	white	40000

test-bdd.py

```
from behave import *
import sys

sys.path.append("../lab_python_oop/lab_python_oop")
from Circle import Circle
from Rectangle import Rectangle
from Square import Square

@given('rectangle with sides of "{first}" and "{second}", color is "{color}" and name is "{name}"')
def step_impl(context, first, second, name, color):
    global shape
    try:
        shape = Rectangle(int(first), int(second), name, color)
        return True
    except:
        return False

@given('circle with radius of "{radius}", color is "{color}" and name is "{name}"')
def step_impl(context, radius, name, color):
    global shape
    try:
        shape = Circle(int(radius), name, color)
        return True
    except:
        return False

@given('square with side of "{side}", color is "{color}" and name is "{name}"')
def step_impl(context, side, name, color):
    global shape
```

```

try:
    shape = Square(int(side), name, color)
    return True
except:
    return False

@when('we try to get properties')
def step_impl(context):
    if shape.area():
        if shape.get_name():
            if shape.color.value:
                return True
    return False

@then('we get area of "{area}", color is "{color}" and name is "{name}"')
def step_impl(context, area, color, name):
    if shape.area() == area:
        if shape.get_name() == name:
            if shape.color.value == color:
                return True
    return False

```

## Экранные формы с примерами выполнения программы

tdd.py

```

===== RESTART: D:\Python 38\test-tdd.py =====
.....
-----
Ran 5 tests in 0.019s

OK
>>> |

```

bdd.py

```
Feature: Testing lab_python_oop # test.feature:1
Scenario Outline: Testing properties of rectangle -- @1.1 Rectangle
    Given rectangle with sides of "9" and "4", color is "blue" and name is "pyramougolnik" # st
    When we try to get properties
    Then we get area of "45", color is "blue" and name is "pyramougolnik" # st

Scenario Outline: Testing properties of rectangle -- @1.2 Rectangle
    Given rectangle with sides of "5" and "1", color is "red" and name is "xXx_rect_xXx" # step
    When we try to get properties
    Then we get area of "5", color is "red" and name is "xXx_rect_xXx" # step

Scenario Outline: Testing properties of rectangle -- @1.3 Rectangle
    Given rectangle with sides of "99" and "98", color is "yellow" and name is "rEcTaNgLe" # st
    When we try to get properties
    Then we get area of "9702", color is "yellow" and name is "rEcTaNgLe" # st

Scenario Outline: Testing properties of circle -- @1.1 Circle
    Given circle with radius of "1", color is "cyan" and name is "krug" # steps/bdd.py:
    When we try to get properties
    Then we get area of "3.141592653589793", color is "cyan" and name is "krug" # steps/bdd.py:

Scenario Outline: Testing properties of circle -- @1.2 Circle
    Given circle with radius of "12", color is "gray" and name is "mega_krug" # steps/bd
    When we try to get properties
    Then we get area of "37.69911184307752", color is "gray" and name is "mega_krug" # steps/bd

Scenario Outline: Testing properties of circle -- @1.3 Circle
    Given circle with radius of "200", color is "black" and name is "super ultra krug" #
    When we try to get properties
    Then we get area of "348.71678454846705", color is "black" and name is "super ultra krug" #

Scenario Outline: Testing properties of circle -- @1.1 Square
    Given square with side of "1", color is "lime" and name is "kvadrat" # steps/bdd.py:28 0.06
    When we try to get properties
    Then we get area of "1", color is "lime" and name is "kvadrat" # steps/bdd.py:45 0.06

Scenario Outline: Testing properties of circle -- @1.2 Square
    Given square with side of "12", color is "pink" and name is "kvadratik" # steps/bdd.py:28 6
    When we try to get properties
    Then we get area of "144", color is "pink" and name is "kvadratik" # steps/bdd.py:45 6

Scenario Outline: Testing properties of circle -- @1.3 Square
    Given square with side of "200", color is "white" and name is "square shape" # steps/bdd.py
    When we try to get properties
    Then we get area of "40000", color is "white" and name is "square shape" # steps/bdd.py

1 feature passed, 0 failed, 0 skipped
9 scenarios passed, 0 failed, 0 skipped
27 steps passed, 0 failed, 0 skipped, 0 undefined
Took 0m0.003s
```