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РК2 Пикяп

departments.py

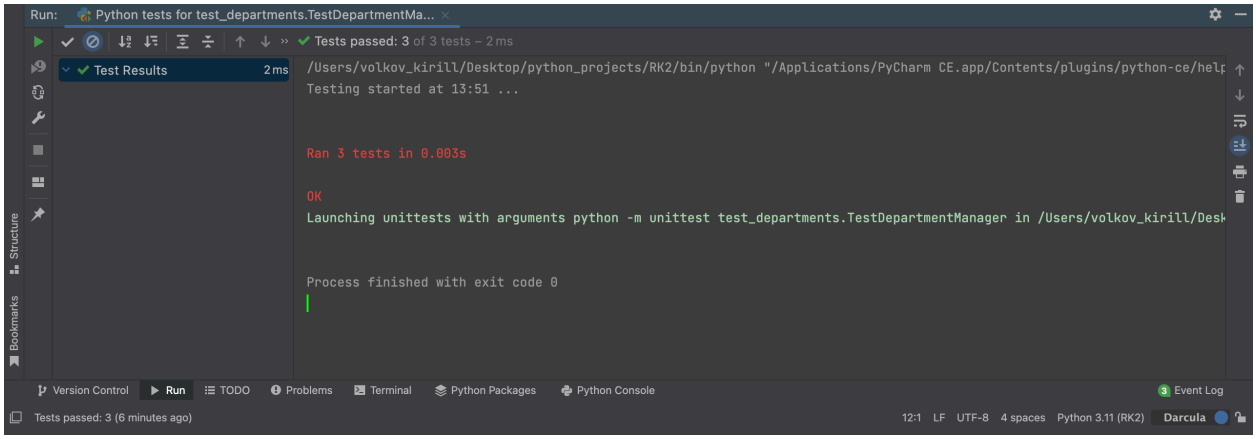
```python
# departments.py
class Department:
    def __init__(self, id: int, name: str, salary: int, faculty_id: int):
        self.id = id
        self.name = name
        self.salary = salary
        self.faculty_id = faculty_id


class Faculty:
    def __init__(self, id: int, name: str):
        self.id = id
        self.name = name


class FacultyDepartment:
    def __init__(self, department_id: int, faculty_id: int):
        self.department_id = department_id
        self.faculty_id = faculty_id


class DepartmentManager:
    def __init__(self, departments, faculties, faculty_departments):
        self.departments = departments
        self.faculties = faculties
        self.faculty_departments = faculty_departments

    def get_departments_starting_with_i(self):
        one_to_many = self._create_one_to_many()
        res = list(filter(lambda x: x[0].startswith('И'), one_to_many))
        return [(name, faculty) for name, _, faculty in res]

    def get_min_salary_by_faculty(self):
        one_to_many = self._create_one_to_many()
        result = []
        for fac in self.faculties:
            deps = list(filter(lambda x: x[2] == fac.name, one_to_many))
            if deps:
                min_salary = min(salary for _, salary, _ in deps)
                result.append((fac.name, min_salary))
        return sorted(result, key=lambda x: x[1])

    def get_sorted_departments_faculties(self):
        many_to_many = self._create_many_to_many()
        return sorted([(dep, fac) for dep, _, fac in many_to_many],
key=lambda x: x[0])

    def _create_one_to_many(self):
        return [(dep.name, dep.salary, fac.name)
                for fac in self.faculties
                for dep in self.departments
                if dep.faculty_id == fac.id]

    def _create_many_to_many(self):
```

```
        many_to_many_temp = [(fac.name, fd.department_id)
                             for fac in self.faculties
                             for fd in self.faculty_departments
                             if fac.id == fd.faculty_id]

        return [(dep.name, dep.salary, fac_name)
                for fac_name, department_id in many_to_many_temp
                for dep in self.departments if dep.id == department_id]
```

test_departmanets.py

```
# test_departments.py
import unittest
from departments import Department, Faculty, FacultyDepartment,
DepartmentManager

class TestDepartmentManager(unittest.TestCase):
    def setUp(self):
        # Тестовые данные
        self.faculties = [
            Faculty(1, 'ИУ'),
            Faculty(2, 'МТ'),
            Faculty(3, 'ФН'),
        ]

        self.departments = [
            Department(1, 'ИУ-5', 90000, 1),
            Department(2, 'ИУ-7', 75000, 1),
            Department(3, 'МТ-3', 60000, 2),
            Department(4, 'ФН-4', 82000, 3),
        ]

        self.faculty_departments = [
            FacultyDepartment(1,1),
            FacultyDepartment(2,1),
            FacultyDepartment(3,2),
            FacultyDepartment(4,3),
        ]

        self.manager = DepartmentManager(self.departments, self.faculties,
self.faculty_departments)

    def test_departments_starting_with_i(self):
        result = self.manager.get_departments_starting_with_i()
        expected = [('ИУ-5', 'ИУ'), ('ИУ-7', 'ИУ')]
        self.assertEqual(result, expected)

    def test_min_salary_by_faculty(self):
        result = self.manager.get_min_salary_by_faculty()
        expected = [('МТ', 60000), ('ИУ', 75000), ('ФН', 82000)]
        self.assertEqual(result, expected)

    def test_sorted_departments_faculties(self):
        result = self.manager.get_sorted_departments_faculties()
        expected = [('ИУ-5', 'ИУ'), ('ИУ-7', 'ИУ'), ('МТ-3', 'МТ'), ('ФН-4',
'ФН')]
        self.assertEqual(result, expected)

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

Результат:


Run:
Python tests for test_departments.TestDepartmentMa...
Tests passed: 3 of 3 tests – 2 ms
Test Results 2 ms
/Users/volkov_kirill/Desktop/python_projects/RK2/bin/python "/Applications/PyCharm CE.app/Contents/plugins/python-ce/help
Testing started at 13:51 ...
Ran 3 tests in 0.003s
OK
Launching unittests with arguments python -m unittest test_departments.TestDepartmentManager in /Users/volkov_kirill/Desk
Process finished with exit code 0
Structure
Bookmarks
Version Control
Run
TODO
Problems
Terminal
Python Packages
Python Console
Event Log
Tests passed: 3 (6 minutes ago)
12:1 LF UTF-8 4 spaces Python 3.11 (RK2)
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