IMN Coding Challenge

Environment

- **Python**: 3.9.4
- **pytest**: 6.2.5 with plugin cov-3.0.0
- **pydantic**: 1.9.0

Project Structure
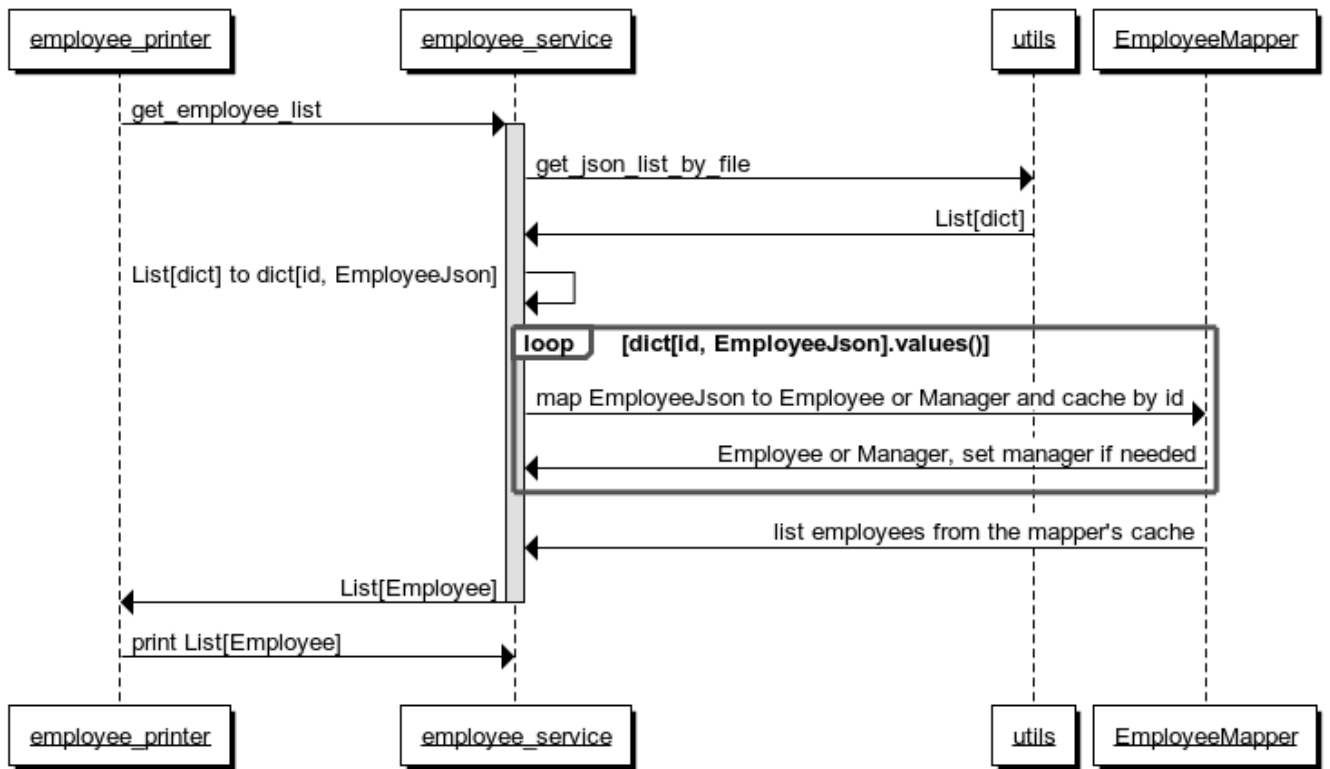
```
root
 – docs
 – src
 – tests
 – resources
```

Whole workflow

click here and paste the following if you want to edit

```
title workflow diagram

employee_printer–>+employee_service: get_employee_list
employee_service–>utils: get_json_list_by_file
utils–>employee_service: List[dict]
employee_service–>employee_service: List[dict] to dict[id, EmployeeJson]
loop dict[id, EmployeeJson].values()
    employee_service–>EmployeeMapper: map EmployeeJson to Employee or
Manager and cache by id
    EmployeeMapper–>employee_service: Employee or Manager, set manager if
needed
end
EmployeeMapper–>employee_service: list employees from the mapper's cache
employee_service–>–employee_printer: List[Employee]
employee_printer–>employee_service: print List[Employee]
```
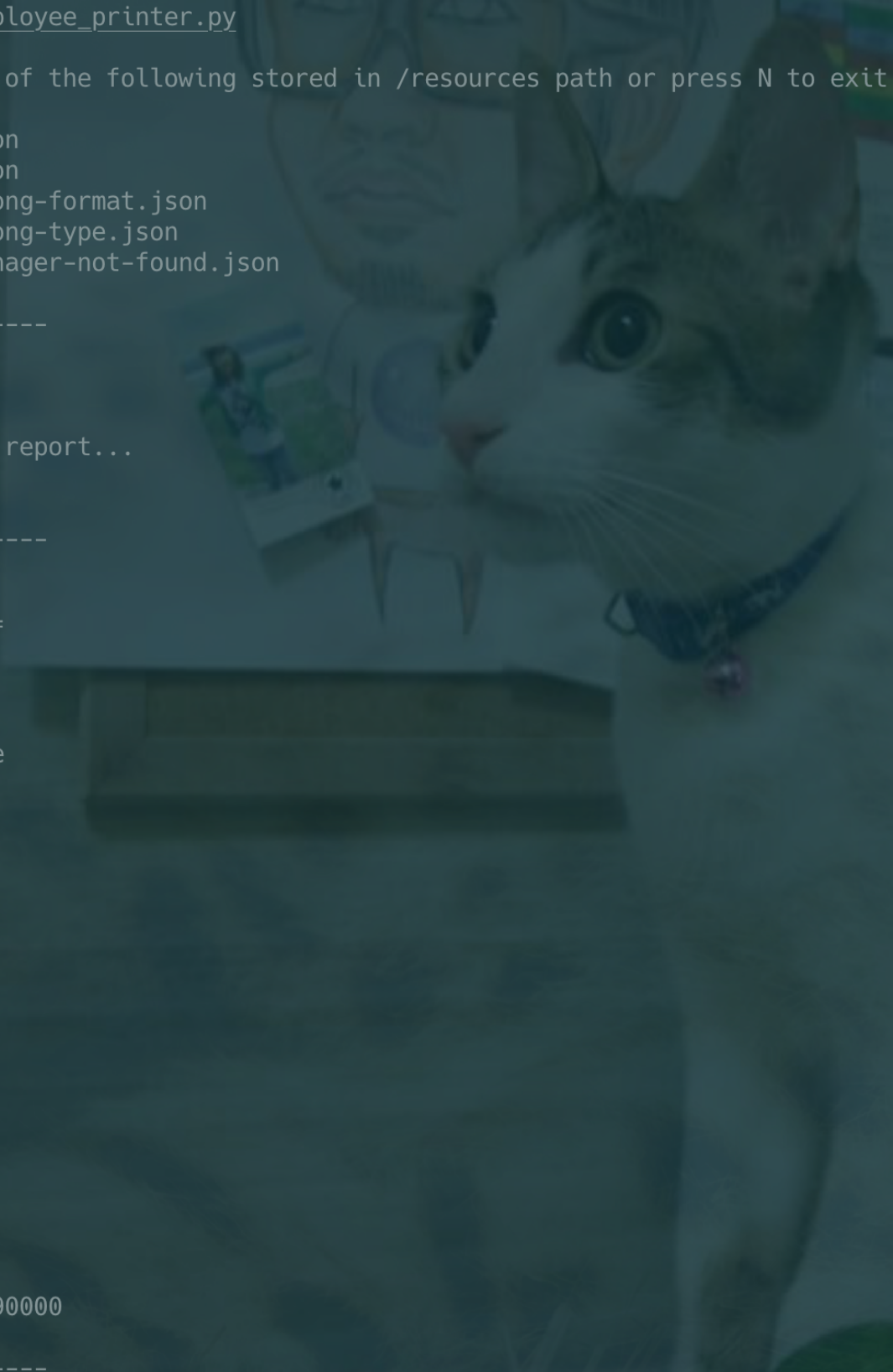
workflow diagram


```
employee_printer    employee_service                    utils    EmployeeMapper

        get_employee_list
        ─────────────────────>

                    get_json_list_by_file
                    ────────────────────────────────────>

                              List[dict]
                    <────────────────────────────────────

        List[dict] to dict[id, EmployeeJson]
                    ┌─┐
                    <─┘

        loop        [dict[id, EmployeeJson].values()]

            map EmployeeJson to Employee or Manager and cache by id
                    ────────────────────────────────────────────>

            Employee or Manager, set manager if needed
                    <────────────────────────────────────────────

                    list employees from the mapper's cache
                    <────────────────────────────────────────────

              List[Employee]
        <─────────────────────

        print List[Employee]
        ─────────────────────>
```

How to get the output

point to the project root directory, and execute the following command to launch the interactive application. It'll list available files in `/resources` path, please copy the file name and paste it on command line to see the result.

```
python3 src/employee_printer.py
```

```
▶ python3 src/employee_printer.py

please input one of the following stored in /resources path or press N to exit

1. employees1.json
2. employees2.json
3. employees3-wrong-format.json
4. employees4-wrong-type.json
5. employees5-manager-not-found.json

-------------------

employees1.json

start generating report...


-------------------

Jeff
Employees of Jeff
        Dave
----------
Dave
Employees of Dave
        Andy
        Dan
        Jason
        Rick
        Suzanne
----------
Andy
----------
Dan
----------
Jason
----------
Rick
----------
Suzanne
----------

total_salary = 590000

-------------------
```

How to test with coverage

point to tests directory

```
pytest -v --cov=../src
```

```
❯ pytest -v --cov=../src                                                    2.13 📊    6.48G 🎨
================================ test session starts ================================
platform darwin -- Python 3.9.4, pytest-6.2.5, py-1.11.0, pluggy-1.0.0 -- /usr/local/opt/python@3.9/bin/python3.9
cachedir: .pytest_cache
rootdir: /Users/KB/Documents/workspace/innovasolutions_IMN_Core/tests
plugins: cov-3.0.0
collected 20 items

test_employee_definition.py::test_employee_set_none_as_manager PASSED               [  5%]
test_employee_definition.py::test_employee_get_member_list_with_five_members_and_sorted_by_name PASSED [ 10%]
test_employee_definition.py::test_employee_json_with_none_id PASSED                  [ 15%]
test_employee_definition.py::test_incorrect_first_name_cases PASSED                  [ 20%]
test_employee_definition.py::test_employee_json_with_none_first_name PASSED          [ 25%]
test_employee_service.py::test_get_employee_list_from_empty_file PASSED              [ 30%]
test_employee_service.py::test_get_employee_list_from_empty_array PASSED             [ 35%]
test_employee_service.py::test_get_employee_list_from_nonexistent_file PASSED        [ 40%]
test_employee_service.py::test_incorrect_json_file_with_wrong_type PASSED            [ 45%]
test_employee_service.py::test_incorrect_json_file_without_id PASSED                 [ 50%]
test_employee_service.py::test_incorrect_json_file_without_first_name PASSED         [ 55%]
test_employee_service.py::test_incorrect_json_file_duplicate_id PASSED               [ 60%]
test_employee_service.py::test_incorrect_manager_not_found PASSED                    [ 65%]
test_employee_service.py::test_get_employee_list_basic PASSED                        [ 70%]
test_employee_service.py::test_get_employee_list_members_relation_and_type PASSED    [ 75%]
test_employee_service.py::test_employee_mapper_map_to_employee_set_none_as_mapper_input PASSED [ 80%]
test_employee_service.py::test_employee_mapper_map_to_manager_set_none_as_mapper_input PASSED [ 85%]
test_employee_service.py::test_employee_mapper_map_to_employee PASSED                [ 90%]
test_employee_service.py::test_employee_mapper_cache_and_type_transfer PASSED        [ 95%]
test_employee_service.py::test_total_salary PASSED                                  [100%]

---------- coverage: platform darwin, python 3.9.4-final-0 -----------
Name                                                                       Stmts   Miss  Cover
------------------------------------------------------------------------------------------------
/Users/KB/Documents/workspace/innovasolutions_IMN_Core/src/__init__.py         0      0   100%
/Users/KB/Documents/workspace/innovasolutions_IMN_Core/src/conf/__init__.py    0      0   100%
/Users/KB/Documents/workspace/innovasolutions_IMN_Core/src/conf/employee_definition.py  65      0   100%
/Users/KB/Documents/workspace/innovasolutions_IMN_Core/src/employee_printer.py  50     50     0%
/Users/KB/Documents/workspace/innovasolutions_IMN_Core/src/service/__init__.py  0      0   100%
/Users/KB/Documents/workspace/innovasolutions_IMN_Core/src/service/employee_service.py  53      0   100%
/Users/KB/Documents/workspace/innovasolutions_IMN_Core/src/utils.py            14      0   100%
------------------------------------------------------------------------------------------------
TOTAL                                                                          182     50    73%

======================================= 20 passed in 0.17s =======================================
```

See more

check out `/docs/pdf/SPEC.pdf`