

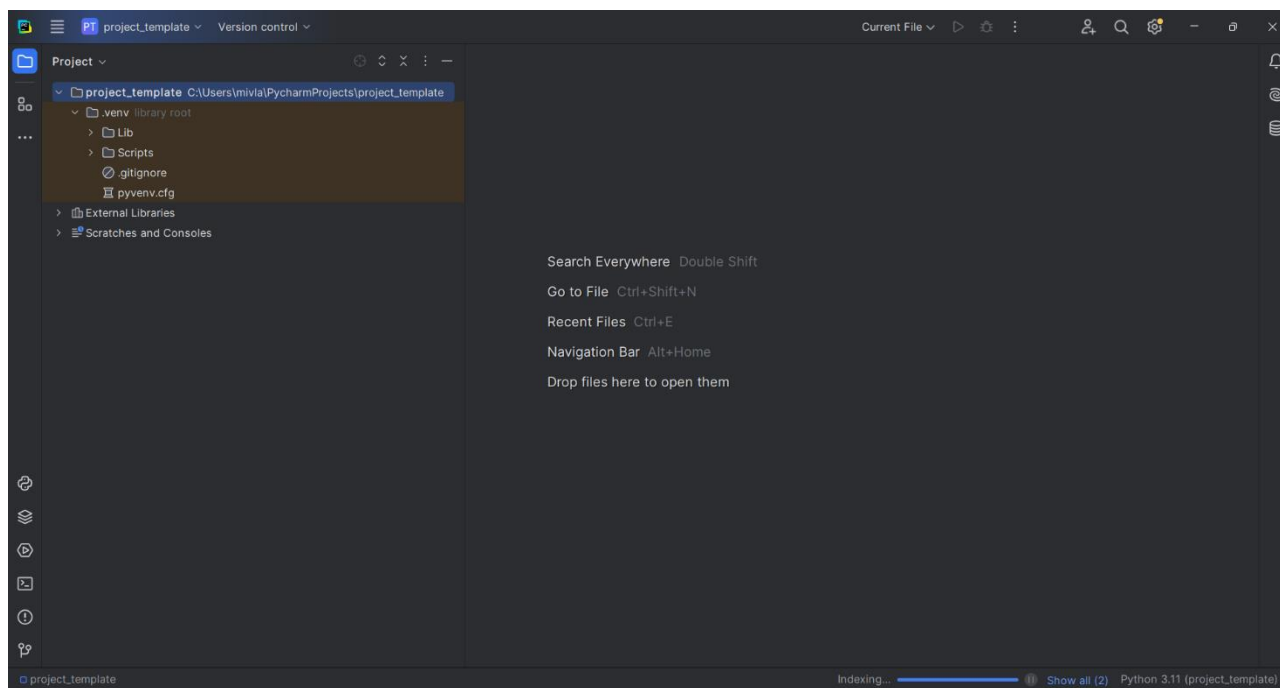
Практична робота №7. Проєкт, модулі, імпорт бібліотек, рір. Робота з файлами у Python.

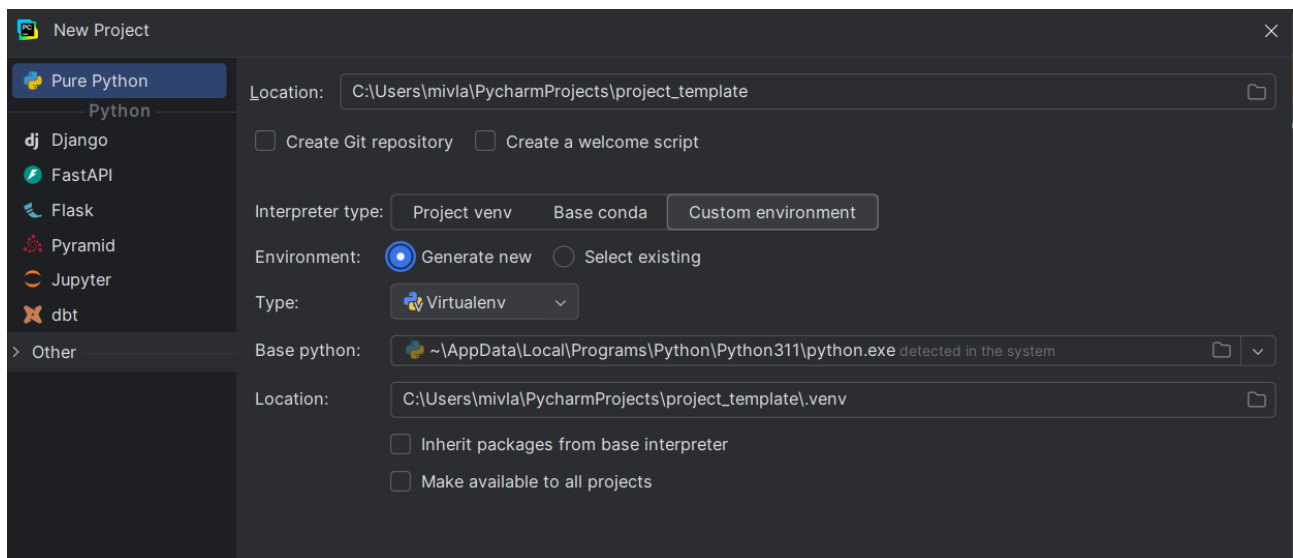
Виговський Владислав, група 3

Посилання на новий репозиторій

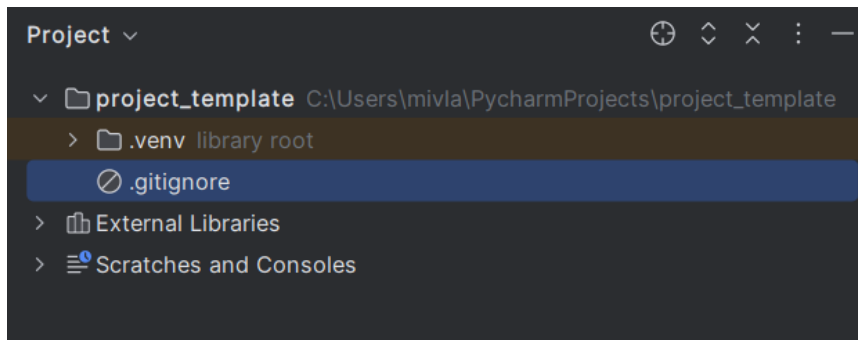
1. Створення нового проєкту.

а.

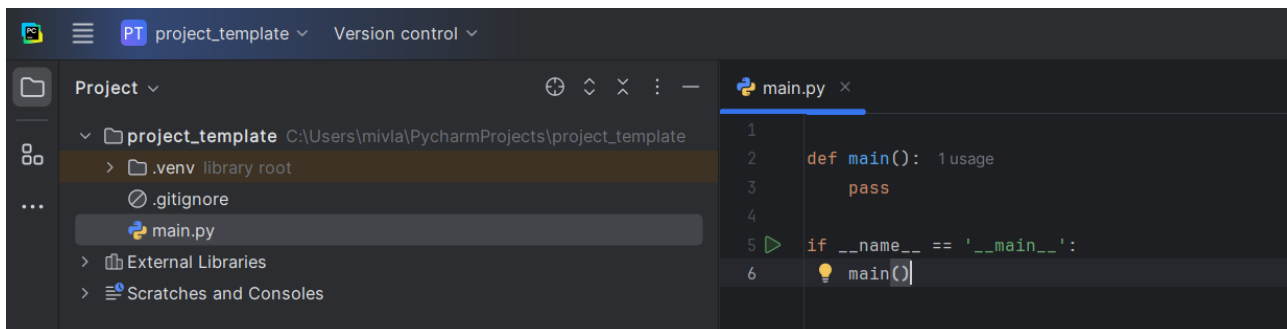




b.



c.



d.

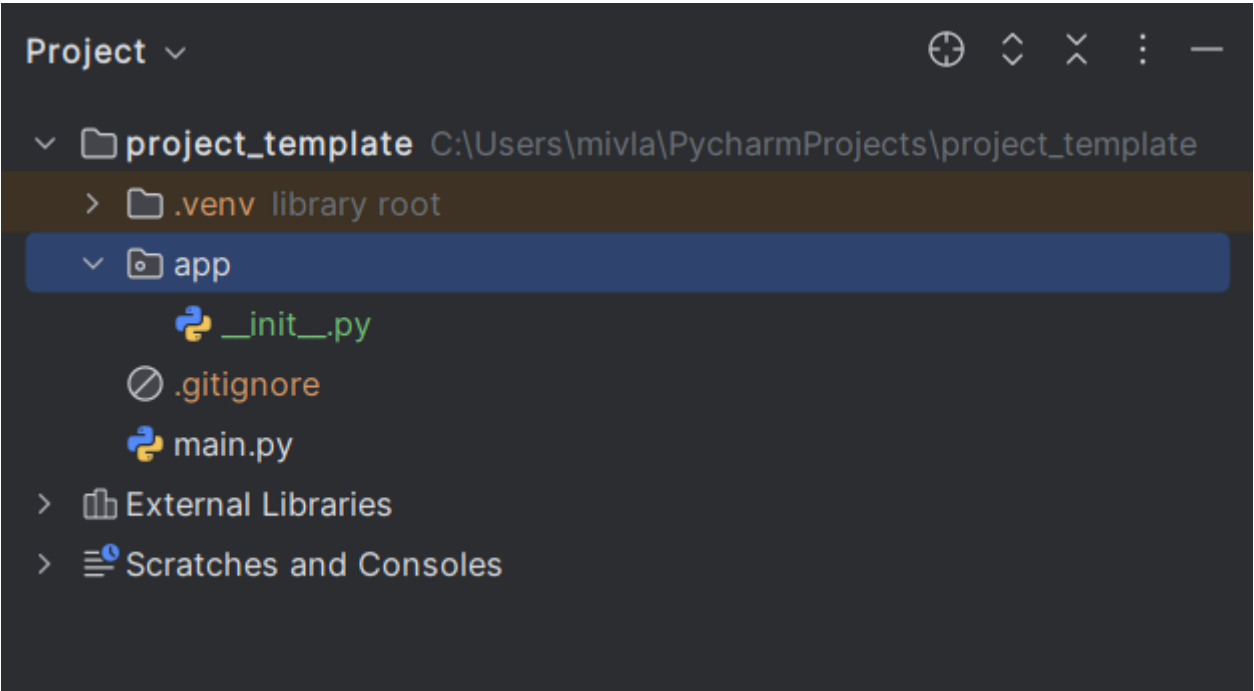


e.

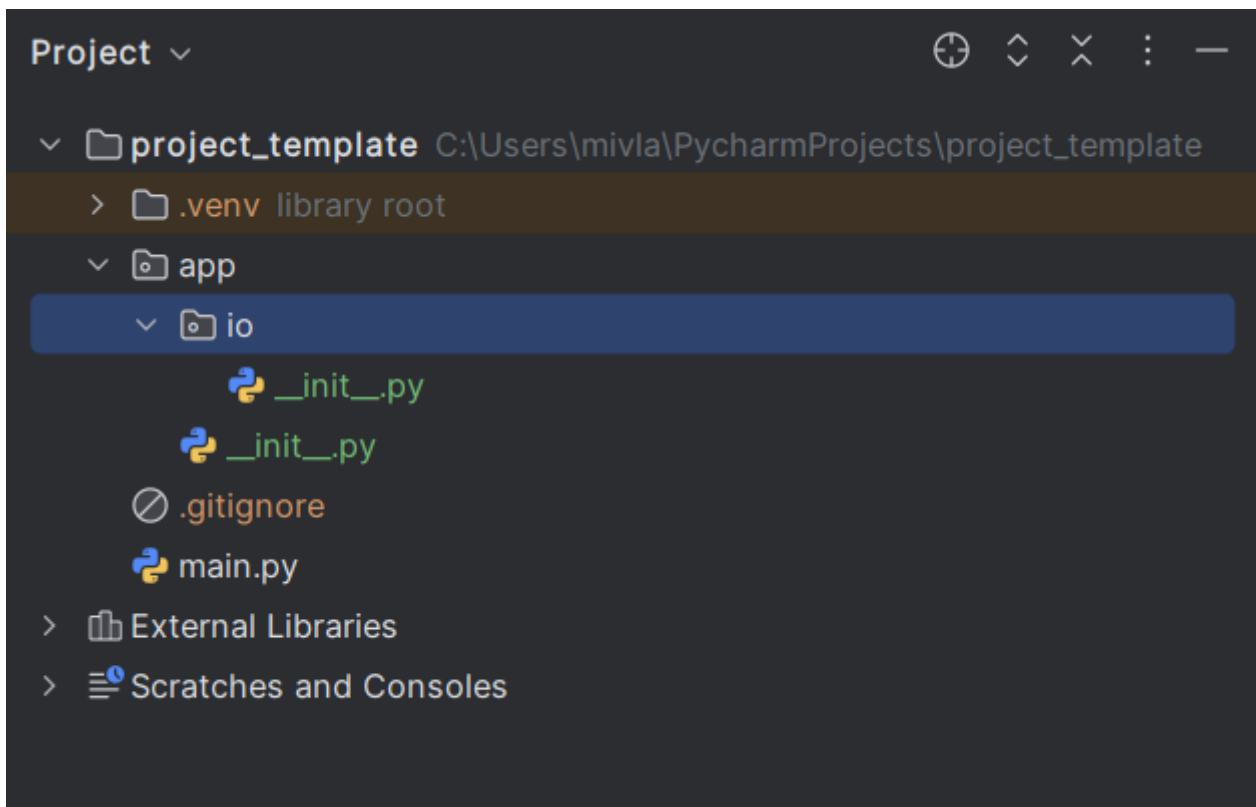
```
(.venv) PS C:\Users\mivla\PycharmProjects\project_template> git add .
(.venv) PS C:\Users\mivla\PycharmProjects\project_template> git commit -m "first commit"
[master (root-commit) 6c90656] first commit
1 file changed, 6 insertions(+)
 create mode 100644 main.py
(.venv) PS C:\Users\mivla\PycharmProjects\project_template> git branch -M main
(.venv) PS C:\Users\mivla\PycharmProjects\project_template> git push -u origin main
Enumerating objects: 3, done.
Counting objects: 100% (3/3), done.
Delta compression using up to 12 threads
Compressing objects: 100% (2/2), done.
Writing objects: 100% (3/3), 284 bytes | 284.00 KiB/s, done.
Total 3 (delta 0), reused 0 (delta 0), pack-reused 0 (from 0)
To https://github.com/vyhovskyi-v/python-for-big-data.git
 * [new branch]      main -> main
branch 'main' set up to track 'origin/main'.
(.venv) PS C:\Users\mivla\PycharmProjects\project_template>
```

2. Структура проекту

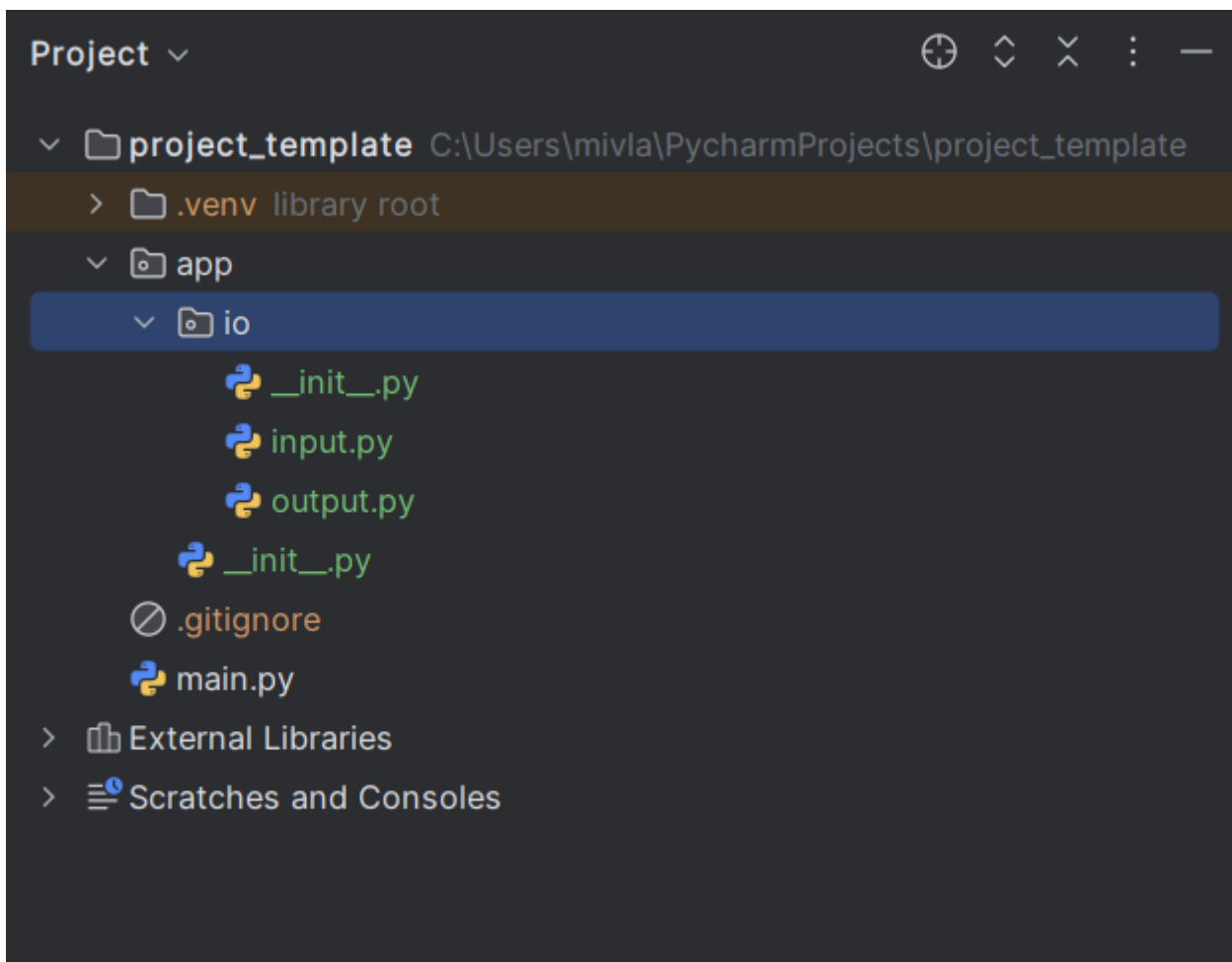
a.



b.



c.



d.



e.

```
(.venv) PS C:\Users\mivla\PycharmProjects\project_template> git add .
(.venv) PS C:\Users\mivla\PycharmProjects\project_template> git commit -m "second commit"
[main 112a0ed] second commit
5 files changed, 0 insertions(+), 0 deletions(-)
create mode 100644 app/__init__.py
create mode 100644 app/io/__init__.py
create mode 100644 app/io/input.py
create mode 100644 app/io/output.py
create mode 100644 tests/__init__.py
(.venv) PS C:\Users\mivla\PycharmProjects\project_template> git push -u origin main
Enumerating objects: 7, done.
Counting objects: 100% (7/7), done.
Delta compression using up to 12 threads
Compressing objects: 100% (4/4), done.
Writing objects: 100% (6/6), 525 bytes | 525.00 KiB/s, done.
Total 6 (delta 0), reused 0 (delta 0), pack-reused 0 (from 0)
To https://github.com/vyhovskyi-v/python-for-big-data.git
6c90656..112a0ed main -> main
branch 'main' set up to track 'origin/main'.
(.venv) PS C:\Users\mivla\PycharmProjects\project_template>
```

3. Работа з модулями.

1.

```
(.venv) PS C:\Users\mivla\PycharmProjects\project_template> where python
(.venv) PS C:\Users\mivla\PycharmProjects\project_template>
```

2.

```
(.venv) PS C:\Users\mivla\PycharmProjects\project_template> where python
(.venv) PS C:\Users\mivla\PycharmProjects\project_template>
```

3.

```
(.venv) PS C:\Users\mivla\PycharmProjects\project_template\.venv> py -m pip install --upgrade pip
Requirement already satisfied: pip in c:\users\mivla\pycharmprojects\project_template\.venv\lib\site-packages (23.2.1)
Collecting pip
  Obtaining dependency information for pip from https://files.pythonhosted.org/packages/c9/bc/b7db44f5f39f9d0494071bddae6880eb645970366d0a200022a1a93d57f5/pip-25.0.1-py3-none-any.whl.metadata
  Using cached pip-25.0.1-py3-none-any.whl.metadata (3.7 kB)
Using cached pip-25.0.1-py3-none-any.whl (1.8 MB)
Installing collected packages: pip
  Attempting uninstall: pip
    Found existing installation: pip 23.2.1
    Uninstalling pip-23.2.1:
      Successfully uninstalled pip-23.2.1
Successfully installed pip-25.0.1
(.venv) PS C:\Users\mivla\PycharmProjects\project_template\.venv> py -m pip --version
pip 25.0.1 from C:\Users\mivla\PycharmProjects\project_template\.venv\Lib\site-packages\pip (python 3.11)
(.venv) PS C:\Users\mivla\PycharmProjects\project_template\.venv>
```

4.

```
(.venv) PS C:\Users\mivla\PycharmProjects\project_template\.venv> pip install numpy
Collecting numpy
  Downloading numpy-2.2.4-cp311-cp311-win_amd64.whl.metadata (60 kB)
  Downloading numpy-2.2.4-cp311-cp311-win_amd64.whl (12.9 MB)
    12.9/12.9 MB 792.8 kB/s eta 0:00:00
Installing collected packages: numpy
Successfully installed numpy-2.2.4
(.venv) PS C:\Users\mivla\PycharmProjects\project_template\.venv>
```

```
(.venv) PS C:\Users\mivla\PycharmProjects\project_template\.venv> py -m pip install "pandas==2.2.2"
Collecting pandas==2.2.2
  Downloading pandas-2.2.2-cp311-cp311-win_amd64.whl.metadata (19 kB)
Requirement already satisfied: numpy>=1.23.2 in c:\users\mivla\pycharmprojects\project_template\.venv\lib\site-packages (from pandas==2.2.2) (2.2.4)
Collecting python-dateutil>=2.8.2 (from pandas==2.2.2)
  Downloading python_dateutil-2.9.0.post0-py2.py3-none-any.whl.metadata (8.4 kB)
Collecting pytz>=2020.1 (from pandas==2.2.2)
  Downloading pytz-2025.2-py2.py3-none-any.whl.metadata (22 kB)
Collecting tzdata>=2022.7 (from pandas==2.2.2)
  Downloading tzdata-2025.2-py2.py3-none-any.whl.metadata (1.4 kB)
Collecting six>=1.5 (from python-dateutil>=2.8.2->pandas==2.2.2)
  Downloading six-1.17.0-py2.py3-none-any.whl.metadata (1.7 kB)
Downloading pandas-2.2.2-cp311-cp311-win_amd64.whl (11.6 MB)
    11.6/11.6 MB 920.1 kB/s eta 0:00:00
Downloading python_dateutil-2.9.0.post0-py2.py3-none-any.whl (229 kB)
Downloading pytz-2025.2-py2.py3-none-any.whl (509 kB)
Downloading tzdata-2025.2-py2.py3-none-any.whl (347 kB)
Downloading six-1.17.0-py2.py3-none-any.whl (11 kB)
Installing collected packages: pytz, tzdata, six, python-dateutil, pandas
Successfully installed pandas-2.2.2 python-dateutil-2.9.0.post0 pytz-2025.2 six-1.17.0 tzdata-2025.2
(.venv) PS C:\Users\mivla\PycharmProjects\project_template\.venv>
```

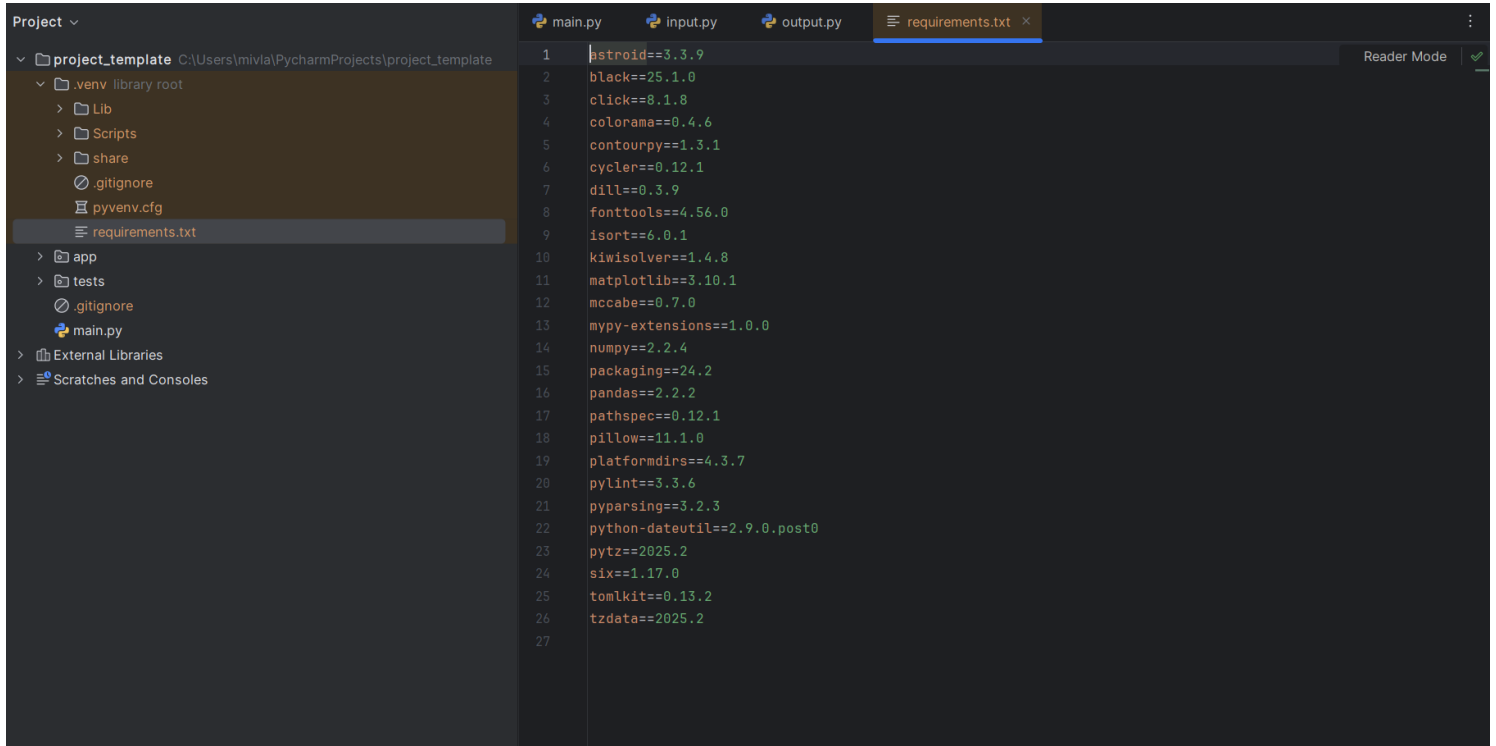
5.

```
(.venv) PS C:\Users\mivla\PycharmProjects\project_template\.venv> pip install matplotlib
Collecting matplotlib
  Downloading matplotlib-3.10.1-cp311-cp311-win_amd64.whl.metadata (11 kB)
Collecting contourpy>=1.0.1 (from matplotlib)
  Downloading contourpy-1.3.1-cp311-cp311-win_amd64.whl.metadata (5.4 kB)
Collecting cycler>=0.10 (from matplotlib)
  Downloading cycler-0.12.1-py3-none-any.whl.metadata (3.8 kB)
Collecting fonttools>=4.22.0 (from matplotlib)
  Downloading fonttools-4.56.0-cp311-cp311-win_amd64.whl.metadata (103 kB)
Collecting kiwisolver>=1.3.1 (from matplotlib)
  Downloading kiwisolver-1.4.8-cp311-cp311-win_amd64.whl.metadata (6.3 kB)
Requirement already satisfied: numpy>=1.23 in c:\users\mivla\pycharmprojects\project_template\.venv\lib\site-packages (from matplotlib) (2.2.4)
Collecting packaging>=20.0 (from matplotlib)
  Using cached packaging-24.2-py3-none-any.whl.metadata (3.2 kB)
Collecting pillow>=8 (from matplotlib)
  Downloading pillow-11.1.0-cp311-cp311-win_amd64.whl.metadata (9.3 kB)
Collecting pyparsing>=2.3.1 (from matplotlib)
  Downloading pyparsing-3.2.3-py3-none-any.whl.metadata (5.0 kB)
Requirement already satisfied: python-dateutil>=2.7 in c:\users\mivla\pycharmprojects\project_template\.venv\lib\site-packages (from matplotlib) (2.9.0.post0)
Requirement already satisfied: six>=1.5 in c:\users\mivla\pycharmprojects\project_template\.venv\lib\site-packages (from python-dateutil>=2.7->matplotlib) (1.17.0)
Downloading matplotlib-3.10.1-cp311-cp311-win_amd64.whl (8.1 MB)
   8.1/8.1 MB 853.2 kB/s eta 0:00:00
Downloading contourpy-1.3.1-cp311-cp311-win_amd64.whl (219 kB)
Downloading cycler-0.12.1-py3-none-any.whl (8.3 kB)
Downloading fonttools-4.56.0-cp311-cp311-win_amd64.whl (2.2 MB)
   2.2/2.2 MB 892.6 kB/s eta 0:00:00
Downloading kiwisolver-1.4.8-cp311-cp311-win_amd64.whl (71 kB)
Using cached packaging-24.2-py3-none-any.whl (65 kB)
```

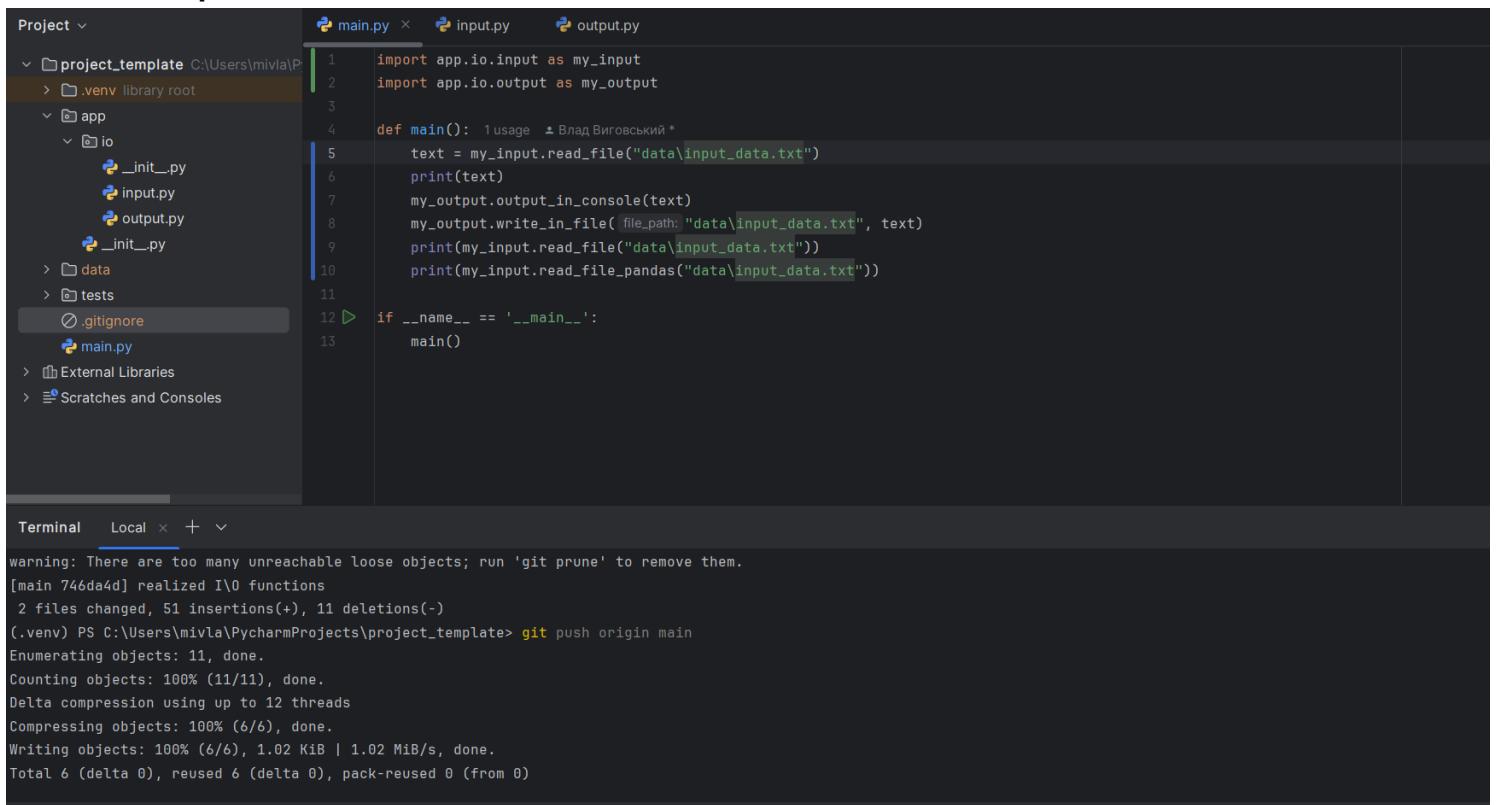
```
(.venv) PS C:\Users\mivla\PycharmProjects\project_template\.venv> pip install pylint
Collecting pylint
  Downloading pylint-3.3.6-py3-none-any.whl.metadata (12 kB)
Collecting astroid<=3.4.0.dev0,>=3.3.8 (from pylint)
  Downloading astroid-3.3.9-py3-none-any.whl.metadata (4.5 kB)
Collecting colorama>=0.4.5 (from pylint)
  Using cached colorama-0.4.6-py2.py3-none-any.whl.metadata (17 kB)
Collecting dill>=0.3.6 (from pylint)
  Downloading dill-0.3.9-py3-none-any.whl.metadata (10 kB)
Collecting isort!=5.13,<7,>=4.2.5 (from pylint)
  Downloading isort-6.0.1-py3-none-any.whl.metadata (11 kB)
Collecting mccabe<0.8,>=0.6 (from pylint)
  Downloading mccabe-0.7.0-py2.py3-none-any.whl.metadata (5.0 kB)
Collecting platformdirs>=2.2 (from pylint)
  Downloading platformdirs-4.3.7-py3-none-any.whl.metadata (11 kB)
Collecting tomlkit>=0.10.1 (from pylint)
  Downloading tomlkit-0.13.2-py3-none-any.whl.metadata (2.7 kB)
Downloading pylint-3.3.6-py3-none-any.whl (522 kB)
Downloading astroid-3.3.9-py3-none-any.whl (275 kB)
Using cached colorama-0.4.6-py2.py3-none-any.whl (25 kB)
Downloading dill-0.3.9-py3-none-any.whl (119 kB)
Downloading isort-6.0.1-py3-none-any.whl (94 kB)
Downloading mccabe-0.7.0-py2.py3-none-any.whl (7.3 kB)
Downloading platformdirs-4.3.7-py3-none-any.whl (18 kB)
Downloading tomlkit-0.13.2-py3-none-any.whl (37 kB)
Installing collected packages: tomlkit, platformdirs, mccabe, isort, dill, colorama, astroid, pylint
Successfully installed astroid-3.3.9 colorama-0.4.6 dill-0.3.9 isort-6.0.1 mccabe-0.7.0 platformdirs-4.3.7 pylint-3.3.6 tomlkit-0.13.2
(.venv) PS C:\Users\mivla\PycharmProjects\project_template\.venv> 
```

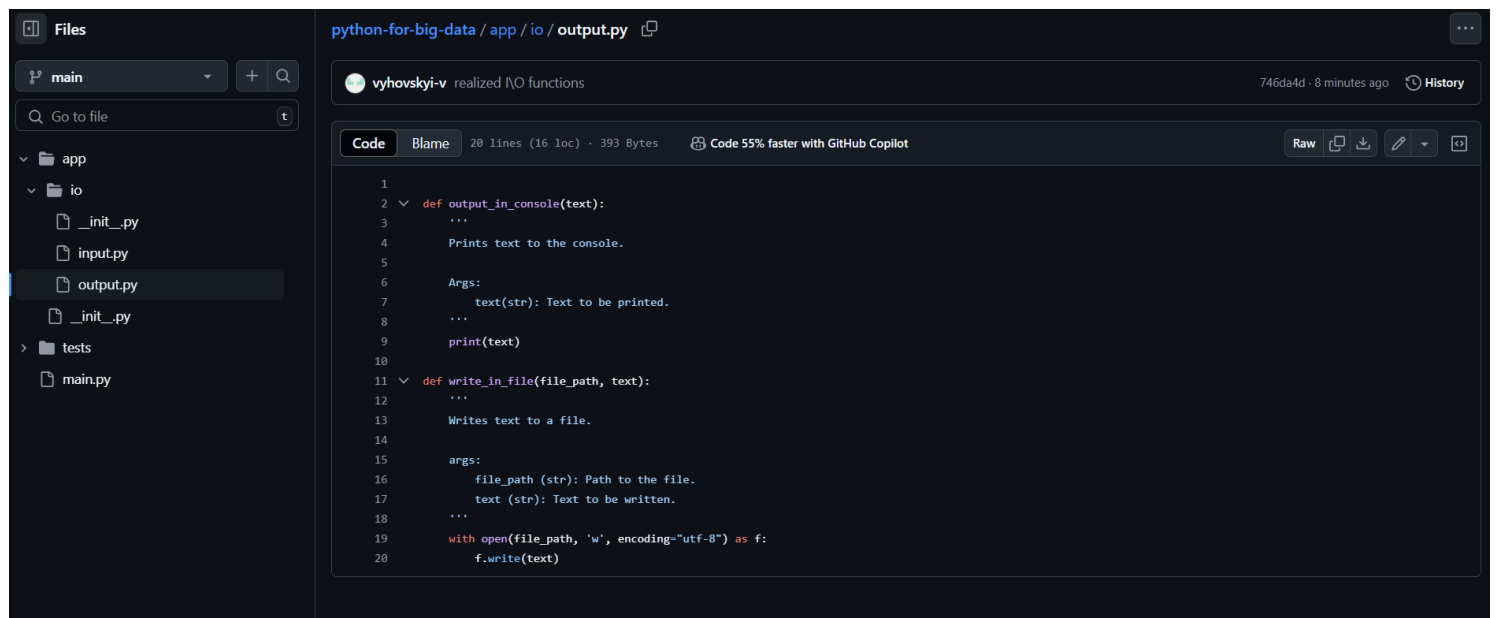
```
Successfully installed astroid-3.3.9 colorama-0.4.6 dill-0.3.9 isort-6.0.1 mccabe-0.7.0 platformdirs-4.3.7 pylint-3.3.6 tomlkit-0.13.2
(.venv) PS C:\Users\mivla\PycharmProjects\project_template\.venv> pip install black
Collecting black
  Downloading black-25.1.0-cp311-cp311-win_amd64.whl.metadata (81 kB)
Collecting click>=8.0.0 (from black)
  Downloading click-8.1.8-py3-none-any.whl.metadata (2.3 kB)
Collecting mypy_extensions>=0.4.3 (from black)
  Downloading mypy_extensions-1.0.0-py3-none-any.whl.metadata (1.1 kB)
Requirement already satisfied: packaging>=22.0 in c:\users\mivla\pycharmprojects\project_template\.venv\lib\site-packages (from black) (24.2)
Collecting pathspec>=0.9.0 (from black)
  Downloading pathspec-0.12.1-py3-none-any.whl.metadata (21 kB)
Requirement already satisfied: platformdirs>=2 in c:\users\mivla\pycharmprojects\project_template\.venv\lib\site-packages (from black) (4.3.7)
Requirement already satisfied: colorama in c:\users\mivla\pycharmprojects\project_template\.venv\lib\site-packages (from click>=8.0.0->black)
Downloading black-25.1.0-cp311-cp311-win_amd64.whl (1.4 MB)
   1.4/1.4 MB 710.9 kB/s eta 0:00:00
Downloading click-8.1.8-py3-none-any.whl (98 kB)
Downloading mypy_extensions-1.0.0-py3-none-any.whl (4.7 kB)
Downloading pathspec-0.12.1-py3-none-any.whl (31 kB)
Installing collected packages: pathspec, mypy_extensions, click, black
Successfully installed black-25.1.0 click-8.1.8 mypy_extensions-1.0.0 pathspec-0.12.1
(.venv) PS C:\Users\mivla\PycharmProjects\project_template\.venv> 
```

6.



4. Робота з файлами.





Висновки:

- a: Створив python проєкт, створив структуру з пакетами app, io , написав функції виводу-вводу, встановив сторонні пакети за допомогою pip
- b: Освоїв базову інтеграцію бібліотек через pip та створення requirements.txt для збереження залежностей.
- c: Структурування коду в модулях та підмодулях — це дуже корисно для великих проєктів. Встановлення залежностей через requirements.txt спростить майбутню командну розробку.