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LAB 5: Static Analysis

Language used: Python

Tool used for static analysis: Mypy

❖ Installation of mypy tool

Code: `pip install mypy`

❖ Static analysis on any file using mypy

Code: `python -m mypy filename`

Repository used: https://github.com/cs91chris/flask_errors_handler.git

❖ Errors:

1. File name: version.py

Output:

```
C:\Users\student\Desktop\New folder\flask_errors_handler-master\flask_errors_handler>python -m mypy version.py
exception.py:1: error: Cannot find implementation or library stub for module named "werkzeug.exceptions" [import]
exception.py:57: error: Need type annotation for "headers" (hint: "headers: Dict[<type>, <type>] = ...") [var-annotated]
dispatchers.py:1: error: Cannot find implementation or library stub for module named "flask" [import]
dispatchers.py:1: note: See https://mypy.readthedocs.io/en/stable/running\_mypy.html#missing-imports
normalize.py:4: error: Cannot find implementation or library stub for module named "flask" [import]
normalize.py:5: error: Cannot find implementation or library stub for module named "werkzeug" [import]
normalize.py:6: error: Cannot find implementation or library stub for module named "werkzeug.routing" [import]
handler.py:3: error: Cannot find implementation or library stub for module named "flask" [import]
handler.py:5: error: Cannot find implementation or library stub for module named "jinja2" [import]
handler.py:6: error: Cannot find implementation or library stub for module named "werkzeug.exceptions" [import]
Found 9 errors in 4 files (checked 1 source file)
```

2. File name: handler.py

Output:

```
C:\Users\student\Desktop\New folder\flask_errors_handler-master\flask_errors_handler>python -m mypy handler.py
exception.py:1: error: Cannot find implementation or library stub for module named "werkzeug.exceptions" [import]
exception.py:57: error: Need type annotation for "headers" (hint: "headers: Dict[<type>, <type>] = ...") [var-annotated]
dispatchers.py:1: error: Cannot find implementation or library stub for module named "flask" [import]
normalize.py:4: error: Cannot find implementation or library stub for module named "flask" [import]
normalize.py:5: error: Cannot find implementation or library stub for module named "werkzeug" [import]
normalize.py:6: error: Cannot find implementation or library stub for module named "werkzeug.routing" [import]
handler.py:3: error: Cannot find implementation or library stub for module named "flask" [import]
handler.py:5: error: Cannot find implementation or library stub for module named "jinja2" [import]
handler.py:6: error: Cannot find implementation or library stub for module named "werkzeug.exceptions" [import]
handler.py:6: note: See https://mypy.readthedocs.io/en/stable/running\_mypy.html#missing-imports
Found 9 errors in 4 files (checked 1 source file)
```

3. File name: Normalize.py

Output:

```
C:\Users\student\Desktop\New folder\flask_errors_handler-master\flask_errors_handler>python -m mypy normalize.py
dispatchers.py:1: error: Cannot find implementation or library stub for module named "flask" [import]
exception.py:1: error: Cannot find implementation or library stub for module named "werkzeug.exceptions" [import]
exception.py:57: error: Need type annotation for "headers" (hint: "headers: Dict[<type>, <type>] = ...") [var-annotated]
normalize.py:4: error: Cannot find implementation or library stub for module named "flask" [import]
normalize.py:5: error: Cannot find implementation or library stub for module named "werkzeug" [import]
normalize.py:6: error: Cannot find implementation or library stub for module named "werkzeug.routing" [import]
normalize.py:6: note: See https://mypy.readthedocs.io/en/stable/running_mypy.html#missing-imports
handler.py:3: error: Cannot find implementation or library stub for module named "flask" [import]
handler.py:5: error: Cannot find implementation or library stub for module named "jinja2" [import]
handler.py:6: error: Cannot find implementation or library stub for module named "werkzeug.exceptions" [import]
Found 9 errors in 4 files (checked 1 source file)
```

- In most of the above files there are 9 errors found while doing static analysis using mypy tool.
- Most of the errors are of missing libraries. So whenever we use that library that is not present then it gives an error of no module found.

4. Test_all.py

```
C:\Users\student\Desktop\New folder\flask_errors_handler-master\flask_errors_handler>cd C:\Users\student\Desktop\New folder\flask_errors_handler-master\tests
C:\Users\student\Desktop\New folder\flask_errors_handler-master\tests>python -m mypy test_all.py
C:\Users\student\Desktop\New folder\flask_errors_handler-master\flask_errors_handler\exception.py:1: error: Cannot find implementation or library stub for module named "werkzeug.exceptions" [import]
C:\Users\student\Desktop\New folder\flask_errors_handler-master\flask_errors_handler\exception.py:57: error: Need type annotation for "headers" (hint: "headers: Dict[<type>, <type>] = ...") [var-annotated]
C:\Users\student\Desktop\New folder\flask_errors_handler-master\flask_errors_handler\dispatchers.py:1: error: Cannot find implementation or library stub for module named "flask" [import]
C:\Users\student\Desktop\New folder\flask_errors_handler-master\flask_errors_handler\normalize.py:4: error: Cannot find implementation or library stub for module named "flask" [import]
C:\Users\student\Desktop\New folder\flask_errors_handler-master\flask_errors_handler\normalize.py:5: error: Cannot find implementation or library stub for module named "werkzeug" [import]
C:\Users\student\Desktop\New folder\flask_errors_handler-master\flask_errors_handler\normalize.py:6: error: Cannot find implementation or library stub for module named "werkzeug.routing" [import]
C:\Users\student\Desktop\New folder\flask_errors_handler-master\flask_errors_handler\handler.py:3: error: Cannot find implementation or library stub for module named "flask" [import]
C:\Users\student\Desktop\New folder\flask_errors_handler-master\flask_errors_handler\handler.py:5: error: Cannot find implementation or library stub for module named "jinja2" [import]
C:\Users\student\Desktop\New folder\flask_errors_handler-master\flask_errors_handler\handler.py:6: error: Cannot find implementation or library stub for module named "werkzeug.exceptions" [import]
test_all.py:1: error: Cannot find implementation or library stub for module named "pytest" [import]
test_all.py:2: error: Cannot find implementation or library stub for module named "werkzeug.routing" [import]
test_all.py:2: note: See https://mypy.readthedocs.io/en/stable/running_mypy.html#missing-imports
test_all.py:3: error: Cannot find implementation or library stub for module named "flask" [import]
test_all.py:4: error: Cannot find implementation or library stub for module named "werkzeug.datastructures" [import]
Found 13 errors in 2 files (checked 1 source file)
```

5. Setup.py

```
C:\Users\student\Desktop\New folder\flask_errors_handler-master>python -m mypy setup.py
setup.py:9: error: Skipping analyzing "setuptools": module is installed, but missing library stubs or py.typed marker [import]
setup.py:10: error: Skipping analyzing "setuptools.command.test": module is installed, but missing library stubs or py.typed marker [import]
setup.py:10: note: See https://mypy.readthedocs.io/en/stable/running_mypy.html#missing-imports
setup.py:38: error: Cannot find implementation or library stub for module named "pytest" [import]
Found 3 errors in 1 file (checked 1 source file)
```

❖ **Analysis of Mypy tool**

- Mypy is a static type checker for Python. It acts as a linter that allows you to write statically typed code, and verify the soundness of your types.
- Mypy has a strict mode that enables a number of additional checks.
- It is very useful in analyzing python code. It shows errors and warnings so we can solve the problem.