Name : Sanepara Khushi Sureshbhai
ID : 202001152
Lab 5 : Static Analysis Tool

MYPY Tool:

Github Repository link:
https://github.com/google-research/python-graphs

1. Control_flow.py

```
C:\Users\student\Downloads\lab 5\python-graphs>cd python_graphs

C:\Users\student\Downloads\lab 5\python-graphs\python_graphs>python -m mypy control_flow.py
instruction.py:61: error: Cannot find implementation or library stub for module named "gast"  [import]
instruction.py:62: error: Library stubs not installed for "six"  [import]
program_utils.py:21: error: Cannot find implementation or library stub for module named "gast"  [import]
program_utils.py:22: error: Library stubs not installed for "six"  [import]
control_flow.py:20: error: Cannot find implementation or library stub for module named "absl"  [import]
control_flow.py:20: note: See https://mypy.readthedocs.io/en/stable/running_mypy.html#missing-imports
control_flow.py:21: error: Cannot find implementation or library stub for module named "gast"  [import]
control_flow.py:24: error: Library stubs not installed for "six"  [import]
control_flow.py:24: note: Hint: "python3 -m pip install types-six"
control_flow.py:24: note: (or run "mypy --install-types" to install all missing stub packages)
Found 7 errors in 3 files (checked 1 source file)
```

Observation : library stub 'gast' is not found. Its check for library stub ia present or not.

2. Data_flow.py

```
Command Prompt

C:\Users\student\Downloads\lab 5\python-graphs\python_graphs>python -m mypy data_flow.py
instruction.py:61: error: Cannot find implementation or library stub for module named "gast"  [import]
instruction.py:62: error: Library stubs not installed for "six"  [import]
program_utils.py:21: error: Cannot find implementation or library stub for module named "gast"  [import]
program_utils.py:22: error: Library stubs not installed for "six"  [import]
control_flow.py:20: error: Cannot find implementation or library stub for module named "absl"  [import]
control_flow.py:21: error: Cannot find implementation or library stub for module named "gast"  [import]
control_flow.py:24: error: Library stubs not installed for "six"  [import]
control_flow.py:24: note: Hint: "python3 -m pip install types-six"
control_flow.py:24: note: (or run "mypy --install-types" to install all missing stub packages)
data_flow.py:19: error: Cannot find implementation or library stub for module named "absl"  [import]
data_flow.py:19: note: See https://mypy.readthedocs.io/en/stable/running_mypy.html#missing-imports
data_flow.py:20: error: Cannot find implementation or library stub for module named "gast"  [import]
Found 9 errors in 4 files (checked 1 source file)

C:\Users\student\Downloads\lab 5\python-graphs\python_graphs>python -m mypy instruction.py
```

Observation : it's check if library stub installed or not. I.e. here stub 'six'

3. Instruction.py

```
Command Prompt

C:\Users\student\Downloads\lab 5\python-graphs\python_graphs>python -m mypy instruction.py
instruction.py:61: error: Cannot find implementation or library stub for module named "gast"  [import]
instruction.py:61: note: See https://mypy.readthedocs.io/en/stable/running_mypy.html#missing-imports
instruction.py:62: error: Library stubs not installed for "six"  [import]
instruction.py:62: note: Hint: "python3 -m pip install types-six"
instruction.py:62: note: (or run "mypy --install-types" to install all missing stub packages)
Found 2 errors in 1 file (checked 1 source file)
```

Observation : it also shows how to install library stub if it is nopt found.
 I.e. Hint: "python3 -m pip install types-six"

4. Program_graph.py

```
C:\Users\student\Downloads\lab 5\python-graphs\python_graphs>python -m mypy program_graph.py
unparser_patch.py:1: error: Cannot find implementation or library stub for module named "astunparse"  [import]
unparser_patch.py:2: error: Cannot find implementation or library stub for module named "gast"  [import]
instruction.py:61: error: Cannot find implementation or library stub for module named "gast"  [import]
instruction.py:62: error: Library stubs not installed for "six"  [import]
program_utils.py:21: error: Cannot find implementation or library stub for module named "gast"  [import]
program_utils.py:22: error: Library stubs not installed for "six"  [import]
control_flow.py:20: error: Cannot find implementation or library stub for module named "absl"  [import]
control_flow.py:21: error: Cannot find implementation or library stub for module named "gast"  [import]
control_flow.py:24: error: Library stubs not installed for "six"  [import]
data_flow.py:19: error: Cannot find implementation or library stub for module named "absl"  [import]
data_flow.py:20: error: Cannot find implementation or library stub for module named "gast"  [import]
program_graph.py:27: error: Cannot find implementation or library stub for module named "absl"  [import]
program_graph.py:28: error: Cannot find implementation or library stub for module named "astunparse"  [import]
program_graph.py:30: error: Cannot find implementation or library stub for module named "gast"  [import]
program_graph.py:38: error: Library stubs not installed for "six"  [import]
program_graph.py:39: error: Library stubs not installed for "six.moves"  [import]
program_graph.py:39: note: Hint: "python3 -m pip install types-six"
program_graph.py:39: note: (or run "mypy --install-types" to install all missing stub packages)
program_graph.py:39: note: See https://mypy.readthedocs.io/en/stable/running_mypy.html#missing-imports
Found 16 errors in 6 files (checked 1 source file)
```

Observation : if multiple library stub is uninstalled then it give hint, how to install all that.
I.e. run "mypy --install-types" to install all missing stub packages

5. Cyclomatic_complexity.py

```
C:\Users\student\Downloads\lab 5\python-graphs\python_graphs>python -m mypy cyclomatic_complexity.py
Success: no issues found in 1 source file
```

Observation : if no suggestion then return success with no issue found.

6. Program_graph_test.py

```
C:\Users\student\Downloads\lab 5\python-graphs\python_graphs>python -m mypy program_graph_test.py
unparser_patch.py:1: error: Cannot find implementation or library stub for module named "astunparse"  [import]
unparser_patch.py:2: error: Cannot find implementation or library stub for module named "gast"  [import]
instruction.py:61: error: Cannot find implementation or library stub for module named "gast"  [import]
instruction.py:62: error: Library stubs not installed for "six"  [import]
program_utils.py:21: error: Cannot find implementation or library stub for module named "gast"  [import]
program_utils.py:22: error: Library stubs not installed for "six"  [import]
control_flow.py:20: error: Cannot find implementation or library stub for module named "absl"  [import]
control_flow.py:21: error: Cannot find implementation or library stub for module named "gast"  [import]
control_flow.py:24: error: Library stubs not installed for "six"  [import]
data_flow.py:19: error: Cannot find implementation or library stub for module named "absl"  [import]
data_flow.py:20: error: Cannot find implementation or library stub for module named "gast"  [import]
program_graph.py:27: error: Cannot find implementation or library stub for module named "absl"  [import]
program_graph.py:28: error: Cannot find implementation or library stub for module named "astunparse"  [import]
program_graph.py:30: error: Cannot find implementation or library stub for module named "gast"  [import]
program_graph.py:38: error: Library stubs not installed for "six"  [import]
program_graph.py:39: error: Library stubs not installed for "six.moves"  [import]
program_graph.py:39: note: Hint: "python3 -m pip install types-six"
program_graph.py:39: note: (or run "mypy --install-types" to install all missing stub packages)
program_graph_test.py:21: error: Cannot find implementation or library stub for module named "absl"  [import]
program_graph_test.py:22: error: Cannot find implementation or library stub for module named "absl.testing"  [import]
program_graph_test.py:22: note: See https://mypy.readthedocs.io/en/stable/running_mypy.html#missing-imports
program_graph_test.py:23: error: Cannot find implementation or library stub for module named "gast"  [import]
Found 19 errors in 7 files (checked 1 source file)
```

Observation : It also provide documentation as hint for library stub. I.e. See https://mypy.readthedocs.io/en/stable/running_mypy.html#missing-imports