

## Summary

This report presents the results of static code analysis and test coverage analysis for the `triangle_classifier.py` program. I used Pylint for static analysis and `pytest-cov` for test coverage to ensure code quality and reliability.

### 1. GitHub Repository

The analyzed code is stored in the following GitHub repository:

<https://github.com/MeiXu2910/helloworld>

### 2. Static Code Analysis with Pylint

I ran Pylint on `triangle_classifier.py`, which initially returned a score of 7.00/10 due to the following issues:

- Trailing whitespace (line 3)
- Trailing newlines (line 15)
- Missing module docstring (line 1)

#### Corrections Made:

- Removed unnecessary trailing whitespace.
- Ensured consistent newline formatting.
- Added a module-level docstring.

After making these changes, we re-ran Pylint, and the final score improved to 10.00/10

### 3. Test Coverage Analysis with `pytest-cov`

We used `pytest` to run unit tests on `triangle_classifier.py` and verified test coverage using `pytest-cov`.

Initial Coverage Results (Before Improvements)

File	Statements	Missing	Coverage
<code>triangle_classifier.py</code>	10	9	10%
<code>test_triangle_classifier.py</code>	12	5	58%
Total	22	14	36%

This indicated that a significant portion of the code was untested.

#### Improvements Made:

- Added test cases to cover all edge cases.

- Ensured all branches of the classify\_triangle function were tested.

#### Final Coverage Results (After Improvements)

File	Statements	Missing	Coverage
triangle_classifier.py	10	0	100%
test_triangle_classifier.py	12	0	100%
Total	22	0	100%

#### 4. Screenshots of Analysis Results

Before Fixing Errors (Pylint Score: 7.00/10)

```

SSW567 — -zsh — 80x33
Downloads      Public
GitHub         U_new.npy
IdeaProjects   Untitled.ipynb
Library        Zoom
Mei_Xu_pca_.ipynb  eclipse
Mei_Xu_svd1.ipynb  eclipse-workspace
Mei_Xu_svd_.ipynb  median_house_value_Mei_Xu.ipynb
Mei_Xu_svd_2.ipynb python
[may@Maydebijibendiannao ~ % cd Class/25Spring/SSW567
cd: no such file or directory: Class/25Spring/SSW567
[may@Maydebijibendiannao ~ % cd Class
cd: no such file or directory: Class
[may@Maydebijibendiannao ~ % cd desktop
[may@Maydebijibendiannao desktop % cd Class
[may@Maydebijibendiannao Class % cd 25Spring
[may@Maydebijibendiannao 25Spring % cd SSW567
[may@Maydebijibendiannao SSW567 % pylint triangle_classifier.py
***** Module triangle_classifier
triangle_classifier.py:3:0: C0303: Trailing whitespace (trailing-whitespace)
triangle_classifier.py:15:0: C0305: Trailing newlines (trailing-newlines)
triangle_classifier.py:1:0: C0114: Missing module docstring (missing-module-docs
tring)

-----
Your code has been rated at 7.00/10

may@Maydebijibendiannao SSW567 % pylint triangle_classifier.py

-----
Your code has been rated at 10.00/10 (previous run: 7.00/10, +3.00)

may@Maydebijibendiannao SSW567 %

```

After Fixing Errors (Pylint Score: 10.00/10)

```
SSW567 — -zsh — 80x33
Downloads      Public
GitHub         U_new.npy
IdeaProjects   Untitled.ipynb
Library        Zoom
Mei_Xu_pca_.ipynb  eclipse
Mei_Xu_svd1.ipynb  eclipse-workspace
Mei_Xu_svd_.ipynb  median_house_value_Mei_Xu.ipynb
Mei_Xu_svd_2.ipynb python
[may@Maydebijibendiannao ~ % cd Class/25Spring/SSW567
cd: no such file or directory: Class/25Spring/SSW567
[may@Maydebijibendiannao ~ % cd Class
cd: no such file or directory: Class
[may@Maydebijibendiannao ~ % cd desktop
[may@Maydebijibendiannao desktop % cd Class
[may@Maydebijibendiannao Class % cd 25Spring
[may@Maydebijibendiannao 25Spring % cd SSW567
[may@Maydebijibendiannao SSW567 % pylint triangle_classifier.py
***** Module triangle_classifier
triangle_classifier.py:3:0: C0303: Trailing whitespace (trailing-whitespace)
triangle_classifier.py:15:0: C0305: Trailing newlines (trailing-newlines)
triangle_classifier.py:1:0: C0114: Missing module docstring (missing-module-docs
tring)

-----
Your code has been rated at 7.00/10

may@Maydebijibendiannao SSW567 % pylint triangle_classifier.py

-----
Your code has been rated at 10.00/10 (previous run: 7.00/10, +3.00)

may@Maydebijibendiannao SSW567 %
```

Initial Coverage Report (36%)

```
SSW567 - -zsn - 80x33
~~~~~
File "/Library/Frameworks/Python.framework/Versions/3.13/lib/python3.13/unittest/main.py", line 149, in createTests
    self.test = loader.discover(self.start, self.pattern, self.top)
~~~~~
File "/Library/Frameworks/Python.framework/Versions/3.13/lib/python3.13/unittest/loader.py", line 308, in discover
    raise ImportError('Start directory is not importable: %r' % start_dir)
ImportError: Start directory is not importable: 'SSW567'
ay@Maydebijibendiannao SSW567 % coverage run -m unittest test_triangle_classifier.py
coverage report -m

-----
an 0 tests in 0.000s

0 TESTS RAN
ame                               Stmts  Miss  Cover   Missing
-----
est_triangle_classifier.py        12     5    58%    5, 8, 11, 14, 17
riangle_classifier.py             10     9    10%    11-21
-----
OTAL                               22    14    36%
ay@Maydebijibendiannao SSW567 % coverage run -m unittest test_triangle_classifier.py

-----
an 0 tests in 0.000s

0 TESTS RAN
av@Maydebiiibendiannao SSW567 % █
```

## Final Coverage Report (100%)

```
SSW567 — -zsh — 80x33
/Versions/3.13/lib/python3.13/site-packages (from pytest) (2.0.0)
Requirement already satisfied: packaging in /Users/may/Library/Python/3.13/lib/python/site-packages (from pytest) (24.2)
Requirement already satisfied: pluggy<2,>=1.5 in /Library/Frameworks/Python.framework/Versions/3.13/lib/python3.13/site-packages (from pytest) (1.5.0)
Requirement already satisfied: coverage>=7.5 in /Library/Frameworks/Python.framework/Versions/3.13/lib/python3.13/site-packages (from coverage[toml]>=7.5->pytest-cov) (7.6.12)
Downloading pytest_cov-6.0.0-py3-none-any.whl (22 kB)
Installing collected packages: pytest-cov
Successfully installed pytest-cov-6.0.0
may@Maydebijibendiannao SSW567 % pytest --cov=triangle_classifier test_triangle_classifier.py

===== test session starts =====
platform darwin -- Python 3.13.0, pytest-8.3.4, pluggy-1.5.0
rootdir: /Users/may/Desktop/Class/25Spring/SSW567
plugins: cov-6.0.0, anyio-4.6.2.post1
collected 5 items

test_triangle_classifier.py ..... [100%]

----- coverage: platform darwin, python 3.13.0-final-0 -----
Name                               Stmts   Miss  Cover
-----
triangle_classifier.py              10      0   100%
TOTAL                              10      0   100%

===== 5 passed in 0.03s =====
may@Maydebijibendiannao SSW567 % pytest --cov=. --cov-report=html test_triangle_classifier.py
```

### Coverage report: 100%

FilesFunctionsClasses

coverage.py v7.6.12, created at 2025-02-27 19:19 -0500

File ▲	statements	missing	excluded	coverage
test_triangle_classifier.py	12	0	0	100%
triangle_classifier.py	10	0	0	100%
<b>Total</b>	<b>22</b>	<b>0</b>	<b>0</b>	<b>100%</b>

coverage.py v7.6.12, created at 2025-02-27 19:19 -0500

## 5. Conclusion

Through static code analysis and test coverage improvements, we achieved:

- Pylint score of 10/10** (code quality issues resolved)
- 100% test coverage** (ensuring all code paths are tested)

This ensures that the triangle\_classifier.py program is clean, efficient, and fully tested.

