IT314
Software Engineering

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Lab: 5

Aim:

Static analysis is a method of examining the source code of a software program without executing it. Static analysis can help detect errors, bugs, vulnerabilities, and other quality issues in the code. Static analysis tools can perform various tasks, such as checking syntax, style, logic, data flow, control flow, and security. Static analysis can improve software reliability, performance, and maintainability by identifying and correcting defects early in development.

Static Analysis Tools:

Static analysis tools are software tools that analyze the source code of a program without executing it. They can help developers find and fix errors, bugs, vulnerabilities, code smells, and other quality issues in their code. Static analysis tools can also measure various code metrics, such as complexity, readability, maintainability, test coverage, and documentation. Static analysis tools can be integrated into the development process as part of the code editor, the version control system, or the continuous integration pipeline. Some examples of static analysis tools are SonarQube, PMD, ESLint, and Pylint.
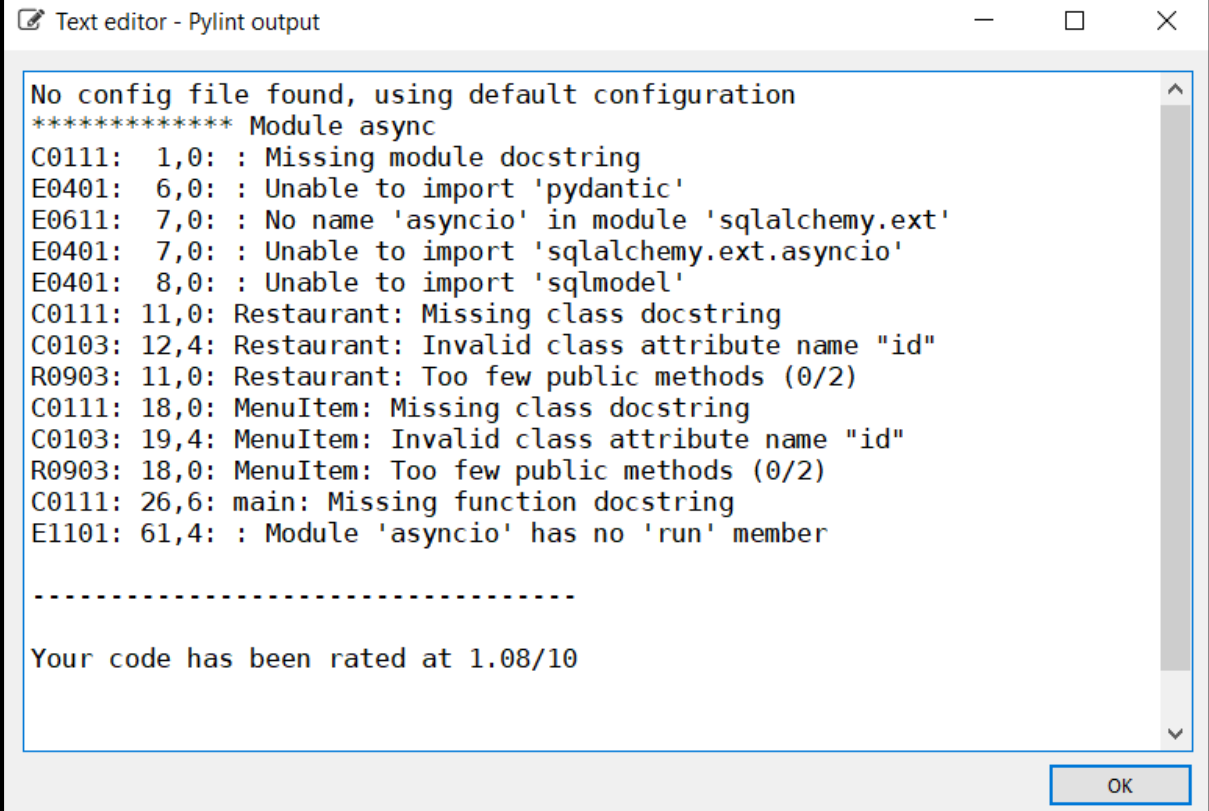
I have used the Pylint tool to analyze a python program's source code.

Note:

Most of the errors are repetitive, so only a few errors have been explained.

1st link:

```
Text editor - Pylint output                                    ─    □    ✕

No config file found, using default configuration
************* Module async
C0111:  1,0: : Missing module docstring
E0401:  6,0: : Unable to import 'pydantic'
E0611:  7,0: : No name 'asyncio' in module 'sqlalchemy.ext'
E0401:  7,0: : Unable to import 'sqlalchemy.ext.asyncio'
E0401:  8,0: : Unable to import 'sqlmodel'
C0111: 11,0: Restaurant: Missing class docstring
C0103: 12,4: Restaurant: Invalid class attribute name "id"
R0903: 11,0: Restaurant: Too few public methods (0/2)
C0111: 18,0: MenuItem: Missing class docstring
C0103: 19,4: MenuItem: Invalid class attribute name "id"
R0903: 18,0: MenuItem: Too few public methods (0/2)
C0111: 26,6: main: Missing function docstring
E1101: 61,4: : Module 'asyncio' has no 'run' member


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Your code has been rated at 1.08/10



                                                             OK
```
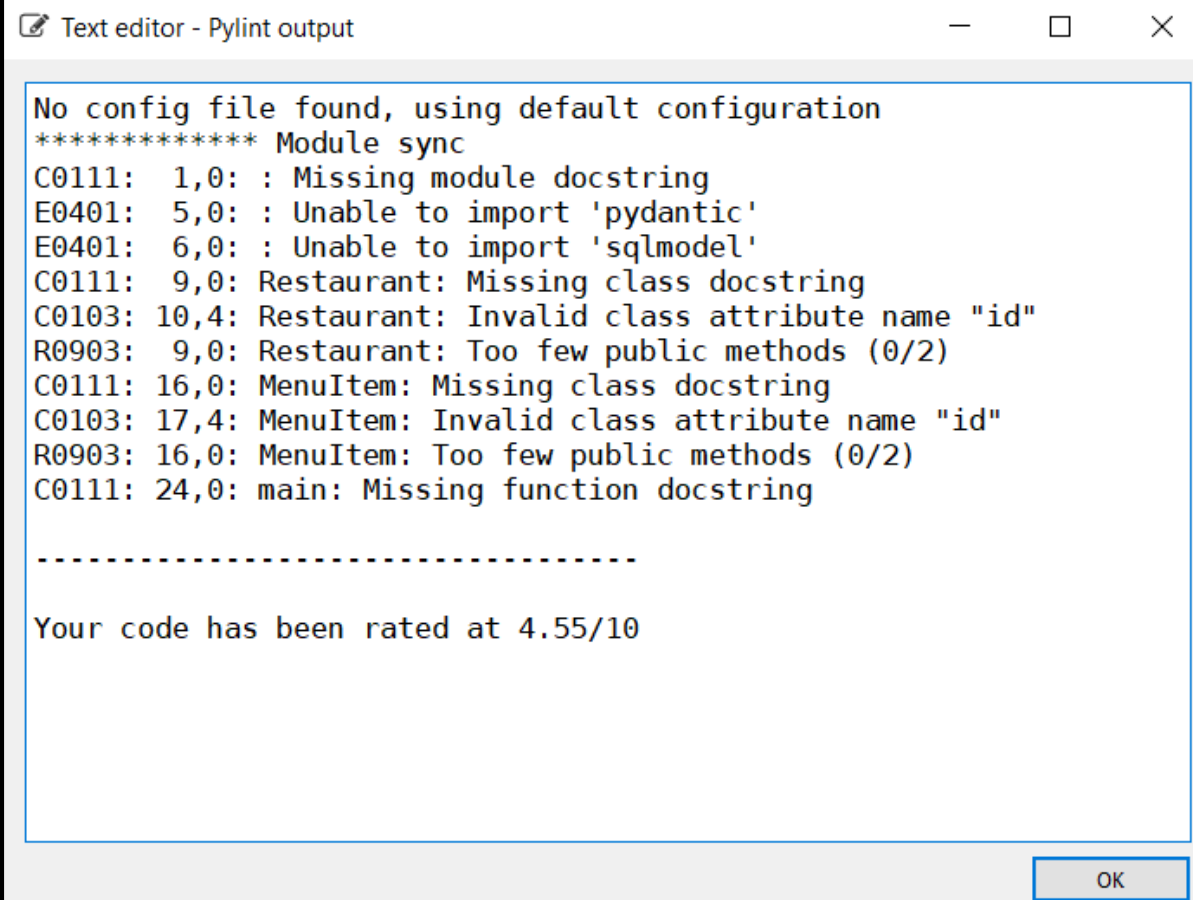
- The "missing module docstring" error occurs when a module does not have a docstring. This can happen when the module has no comments, or the comments are not in the proper format.
- Unable to import Pendantic installed; Pedantic is not installed.
- The error "no name 'asyncio' in module" occurs when you try to import the asyncio module, but it is not found in your Python environment. This module is typically included in Python's standard library, but it may not be available if you are using an older version of Python.

2nd link:

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Text editor - Pylint output                              —    □    ✕

No config file found, using default configuration
************* Module sync
C0111:  1,0: : Missing module docstring
E0401:  5,0: : Unable to import 'pydantic'
E0401:  6,0: : Unable to import 'sqlmodel'
C0111:  9,0: Restaurant: Missing class docstring
C0103: 10,4: Restaurant: Invalid class attribute name "id"
R0903:  9,0: Restaurant: Too few public methods (0/2)
C0111: 16,0: MenuItem: Missing class docstring
C0103: 17,4: MenuItem: Invalid class attribute name "id"
R0903: 16,0: MenuItem: Too few public methods (0/2)
C0111: 24,0: main: Missing function docstring

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Your code has been rated at 4.55/10


                                                      OK
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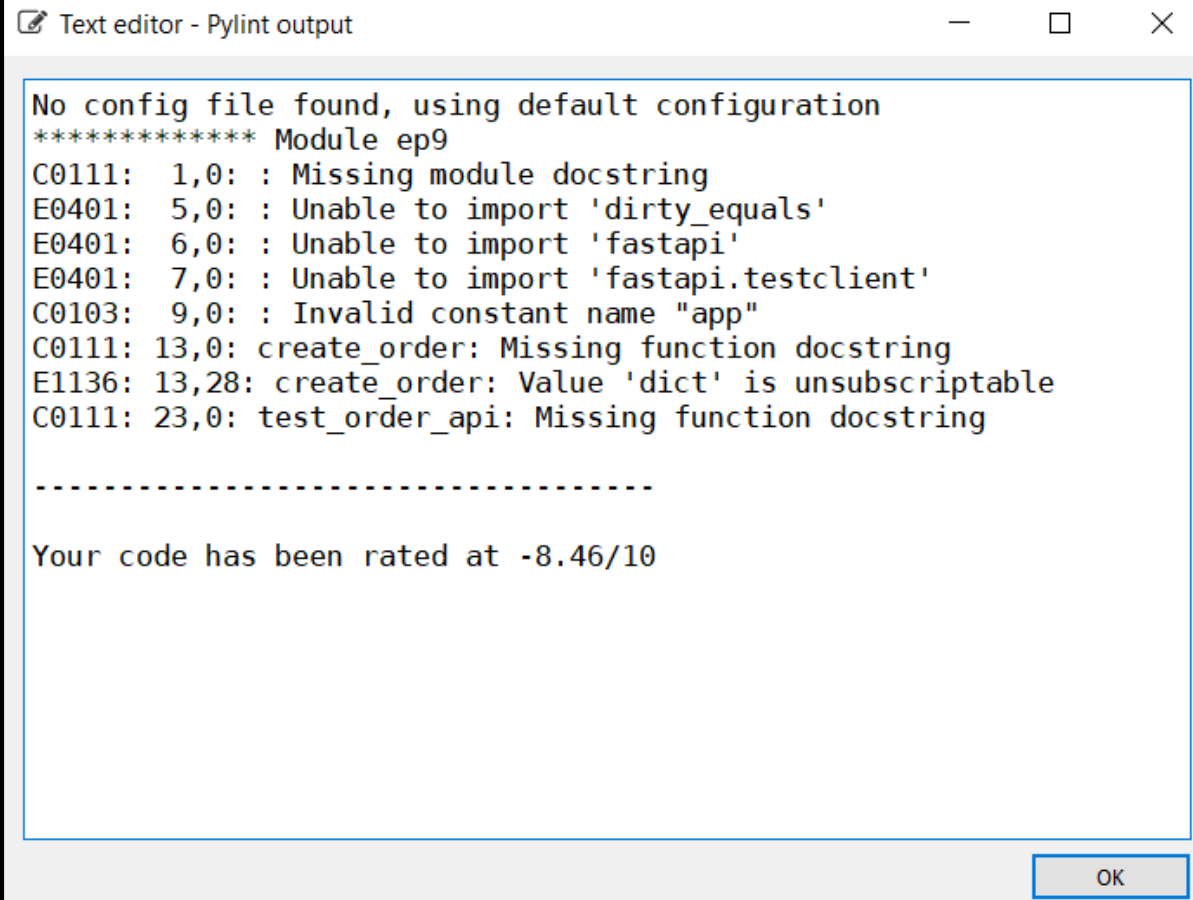
- The "unable to import 'dirty_equals'" error occurs when you try to import the 'dirty_equals' module in your Python code, but the module cannot be found.
- Encountering an error related to the "id" attribute in a class related to a restaurant.
- Main: Missing function docstring indicates: encountering a warning or error related to a missing function docstring in your code.

3rd link:

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Text editor - Pylint output                        —   □   ✕

No config file found, using default configuration
************* Module ep9
C0111:  1,0: : Missing module docstring
E0401:  5,0: : Unable to import 'dirty_equals'
E0401:  6,0: : Unable to import 'fastapi'
E0401:  7,0: : Unable to import 'fastapi.testclient'
C0103:  9,0: : Invalid constant name "app"
C0111: 13,0: create_order: Missing function docstring
E1136: 13,28: create_order: Value 'dict' is unsubscriptable
C0111: 23,0: test_order_api: Missing function docstring

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Your code has been rated at -8.46/10

                                              OK
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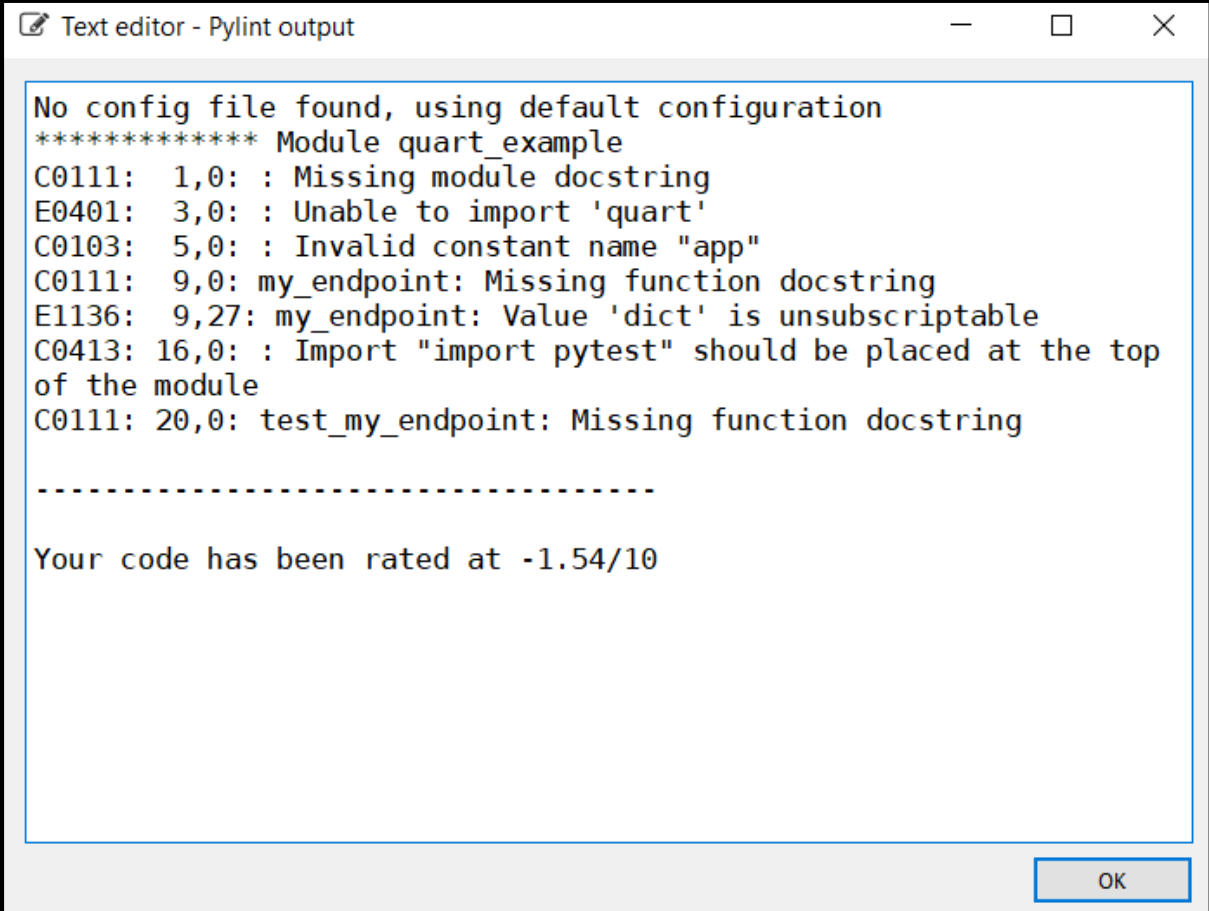
- Encountering a warning or error related to a missing function docstring in a function called "test_order_api.
- Encountering a warning or error related to a missing function docstring in a function called "create_order." A docstring is a string literal that appears as the first statement in a function or method definition and is used to document the purpose and usage of the function. Make sure that the "create_order" function has a docstring.
- Encountering an error related to importing a module or function called 'dirty_equals.'

4th link:

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Text editor - Pylint output                            —    □    ✕

No config file found, using default configuration
************* Module quart_example
C0111:  1,0: : Missing module docstring
E0401:  3,0: : Unable to import 'quart'
C0103:  5,0: : Invalid constant name "app"
C0111:  9,0: my_endpoint: Missing function docstring
E1136:  9,27: my_endpoint: Value 'dict' is unsubscriptable
C0413: 16,0: : Import "import pytest" should be placed at the top
of the module
C0111: 20,0: test_my_endpoint: Missing function docstring


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Your code has been rated at -1.54/10




                                                        OK
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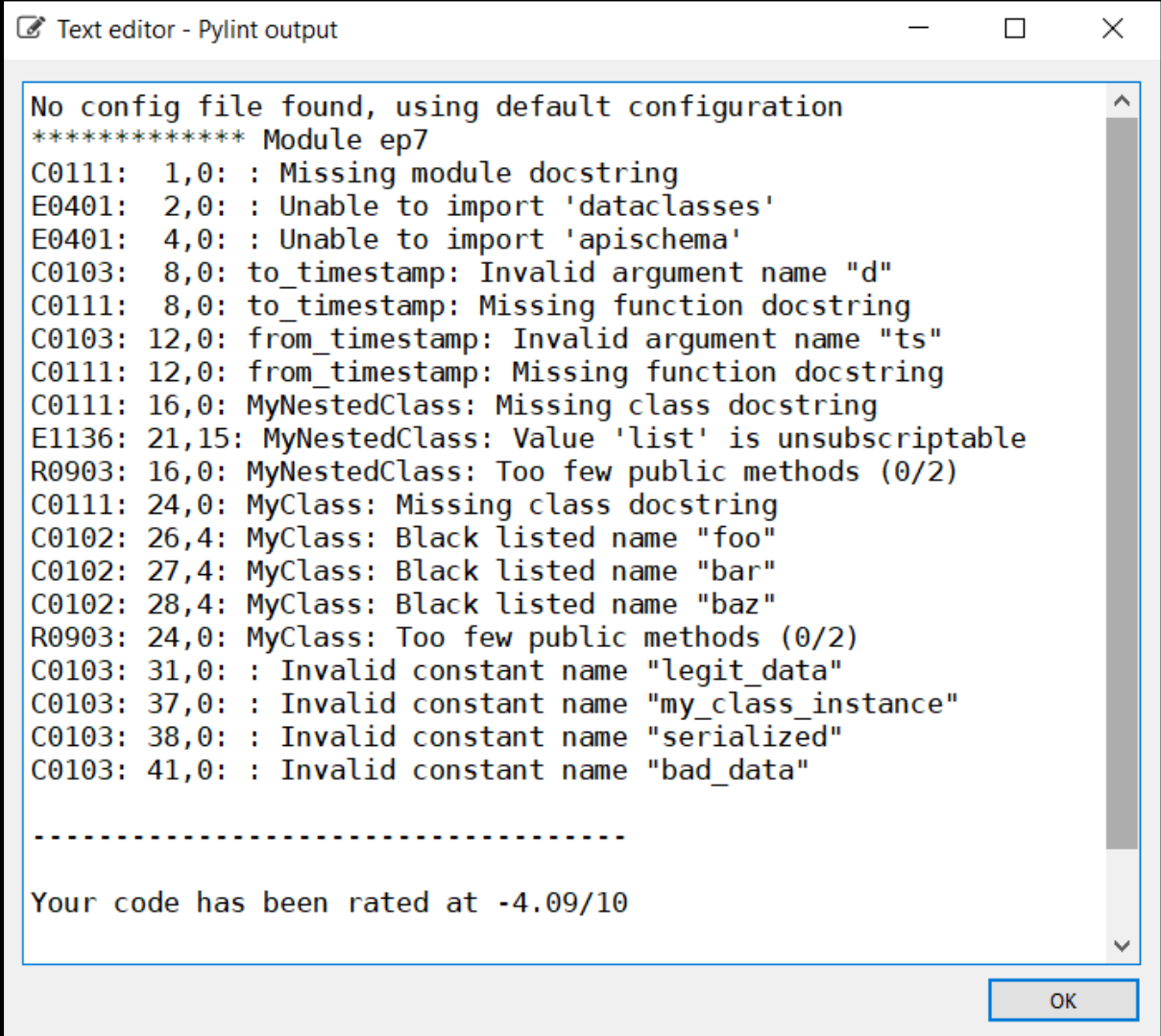
- Encountering an error related to an invalid constant name, "app."
- Encountering an error related to trying to subscript or access a value from a dictionary-like object that is not a dictionary. The error message you are seeing suggests that you are trying to access a value from an object that is a dictionary, but it is not a dictionary. This can happen if you accidentally pass a variable, not a dictionary, to a function that expects a dictionary.
- The error message you are seeing suggests that the "import pytest" statement should be placed at the top of your module.

5th link:

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Text editor - Pylint output                                    —    □    ✕

No config file found, using default configuration
************* Module ep7
C0111:  1,0: : Missing module docstring
E0401:  2,0: : Unable to import 'dataclasses'
E0401:  4,0: : Unable to import 'apischema'
C0103:  8,0: to_timestamp: Invalid argument name "d"
C0111:  8,0: to_timestamp: Missing function docstring
C0103: 12,0: from_timestamp: Invalid argument name "ts"
C0111: 12,0: from_timestamp: Missing function docstring
C0111: 16,0: MyNestedClass: Missing class docstring
E1136: 21,15: MyNestedClass: Value 'list' is unsubscriptable
R0903: 16,0: MyNestedClass: Too few public methods (0/2)
C0111: 24,0: MyClass: Missing class docstring
C0102: 26,4: MyClass: Black listed name "foo"
C0102: 27,4: MyClass: Black listed name "bar"
C0102: 28,4: MyClass: Black listed name "baz"
R0903: 24,0: MyClass: Too few public methods (0/2)
C0103: 31,0: : Invalid constant name "legit_data"
C0103: 37,0: : Invalid constant name "my_class_instance"
C0103: 38,0: : Invalid constant name "serialized"
C0103: 41,0: : Invalid constant name "bad_data"


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Your code has been rated at -4.09/10


                                                              OK
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- Encountering an error related to an invalid constant name "legit_data".
- Encountering an error related to using a blacklisted name "foo" in your MyClass.
- Encountering an error related to importing the "apischema" library. The first thing to check is whether you have installed the "API schema" library. You can use the pip package manager to install it by running the command pip install API schema. You may encounter an error when importing it if you have not installed it yet.