

Instituto Tecnológico de Monterrey

6.2 Ejercicio de programación 3 y pruebas de unidad

Maestría en inteligencia Artificial Aplicada (MNA)

Pruebas de software y aseguramiento de la calidad
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Repositorio en GitHub:

https://github.com/dcarloa/A01017779_A6.2

Instalación

Al identificar mi código, VS Studio me solicitó instalar pytest para su uso en las pruebas.

```

Output
Show output from: General
---- Installing 'pytest' ----
Collecting pytest
  Downloading pytest-8.3.4-py3-none-any.whl.metadata (7.5 kB)
Requirement already satisfied: colorama in c:\users\d_car\appdata\local\packages\pythonsoftwarefoundation.python.3.11_qbz5n2kfra8p0\localcache\local-packages\python311\site-packages (from pytest) (0.4.6)
Collecting iniconfig (from pytest)
  Downloading iniconfig-2.0.0-py3-none-any.whl.metadata (2.6 kB)
Requirement already satisfied: packaging in c:\users\d_car\appdata\local\packages\pythonsoftwarefoundation.python.3.11_qbz5n2kfra8p0\localcache\local-packages\python311\site-packages (from pytest) (23.2)
Collecting pluggy<2.0,>=1.5 (from pytest)
  Downloading pluggy-1.5.0-py3-none-any.whl.metadata (4.8 kB)
Downloading pytest-8.3.4-py3-none-any.whl (343 kB)
Downloading pluggy-1.5.0-py3-none-any.whl (20 kB)
Downloading iniconfig-2.0.0-py3-none-any.whl (5.9 kB)
Installing collected packages: pluggy, iniconfig, pytest
WARNING: The scripts pytest.exe and pytest.exe are installed in 'C:\Users\d_car\AppData\Local\Packages\PythonSoftwareFoundation.Python.3.11_qbz5n2kfra8p0\LocalCache\local-packages\Python311\Scripts' which is not on PATH.
Consider adding this directory to PATH or, if you prefer to suppress this warning, use --no-warn-script-location.
Successfully installed iniconfig-2.0.0 pluggy-1.5.0 pytest-8.3.4
[notice] A new release of pip is available: 25.0 -> 25.0.1
[notice] To update, run: C:\Users\d_car\AppData\Local\Microsoft\WindowsApps\PythonSoftwareFoundation.Python.3.11_qbz5n2kfra8p0\python.exe -m pip install --upgrade pip
---- Successfully installed 'pytest' ----
  
```

• **Problema 1: Reservation System**

Instrucciones:

Req1. Req 1. Implement a set of classes in Python that implements two abstractions:

1. *Hotel*
2. *Reservation*
3. *Customers*

Req 2. Implement a set of methods to handle the next persistent behaviors (stored in files):

1. *Hotels*
 - a. *Create Hotel*
 - b. *Delete Hotel*
 - c. *Display Hotel information*
 - d. *Modify Hotel Information*
 - e. *Reserve a Room*
 - f. *Cancel a Reservation*
2. *Customer*
 - a. *Create Customer*

- b. Delete a Customer
- c. Display Customer Information
- d. Modify Customer Information

3. Reservation

- a. Create a Reservation (Customer, Hotel)
- b. Cancel a Reservation

You are free to decide the attributes within each class that enable the required behavior.

Req 3. Implement unit test cases to exercise the methods in each class. Use the unittest module in Python.

Req 4. The code coverage for all unittests should accumulate at least 85% of line coverage.

Req 5. The program shall include the mechanism to handle invalid data in the file. Errors should be displayed in the console and the execution must continue.

Req 6. Be compliant with PEP8.

Req 7. The source code must show no warnings using Fleak and PyLint.

Para validar este requisito, ejecuta las pruebas unitarias en test_hotel_system.py usando unittest.:

```
PS C:\Users\d_car\source\repos\hotel_system\hotel_system> python -m unittest test_hotel_system.py
....
-----
Ran 4 tests in 0.001s

OK
PS C:\Users\d_car\source\repos\hotel_system\hotel_system>
```

Al parecer no hubo mayor complicación en las 4 pruebas que se ejecutaron sobre el código. Las 4 pruebas que se ejecutaron fueron:

1. Creación de Hotel
2. Creación de Cliente
3. Creación de Reserva
4. Proceso de Reserva de Habitaciones

Para medir el porcentaje de cobertura, se instaló coverage.py con “pip install coverage”, luego se ejecutó en el código que se realizó, obteniendo los siguientes resultados:

```

PS C:\Users\d_car\source\repos\hotel_system\hotel_system> python -m coverage run -m unittest test_hotel_system.py
>> python -m coverage report -m
....
-----
Ran 4 tests in 0.001s

OK
Name                               Stmts  Miss  Cover   Missing
-----
hotel_system.py                     75     32    57%    17, 27-28, 33-36, 41-45, 52, 65, 70-71, 76-79, 84-88, 102, 111-112, 117-120
test_hotel_system.py                24      1    96%     34
-----
TOTAL                               99     33    67%
PS C:\Users\d_car\source\repos\hotel_system\hotel_system>

```

Esto me dice que aún no cumplo el requisito de tener al menos un 85% en las líneas de código, ya que al analizar los resultados se aprecia tan solo un 57% en el programa `hotel_system.py` y un 96% en `test_hotel_system.py` lo que da un total de 67%, que es menos a lo solicitado.

Después de trabajar en los ajustes requeridos, tales como aumentar la cantidad de pruebas, se pudo obtener los siguientes resultados:

```

PS C:\Users\d_car\source\repos\hotel_system\hotel_system> python -m coverage run -m unittest test_hotel_system.py
>> python -m coverage report -m
.....
-----
Ran 10 tests in 0.032s

OK
Name                               Stmts  Miss  Cover   Missing
-----
hotel_system.py                     81      5    94%    34, 52, 84, 95, 125
test_hotel_system.py                69      1    99%    111
-----
TOTAL                               150      6    96%
PS C:\Users\d_car\source\repos\hotel_system\hotel_system>

```

Cumplimiento de PEP8:

Se corrió la siguiente línea `python -m flake8 hotel_system.py test_hotel_system.py --ignore=E501` con el objetivo de auditar mi código con base en PEP8 y ver posibles errores:

```

PS C:\Users\d_car\source\repos\hotel_system\hotel_system> python -m flake8 hotel_system.py test_hotel_system.py --ignore=E501
hotel_system.py:4:1: E302 expected 2 blank lines, found 1
hotel_system.py:6:1: W293 blank line contains whitespace
hotel_system.py:14:1: W293 blank line contains whitespace
hotel_system.py:23:1: W293 blank line contains whitespace
hotel_system.py:61:1: E302 expected 2 blank lines, found 1
hotel_system.py:69:1: W293 blank line contains whitespace
hotel_system.py:73:1: W293 blank line contains whitespace
hotel_system.py:97:1: E302 expected 2 blank lines, found 1
hotel_system.py:99:1: W293 blank line contains whitespace
test_hotel_system.py:3:1: F401 'json' imported but unused
test_hotel_system.py:6:1: E302 expected 2 blank lines, found 1
PS C:\Users\d_car\source\repos\hotel_system\hotel_system>

```

Después de hacer ajustes principalmente relacionados a espacios en blanco y saltos de líneas, se logró hacer ajustes que ajustaran el código a no tener errores:

```

PS C:\Users\d_car\source\repos\hotel_system\hotel_system> python -m flake8 hotel_system.py test_hotel_system.py --ignore=E501
PS C:\Users\d_car\source\repos\hotel_system\hotel_system>

```

Cumplimiento de Pylint:

Tras correr la evaluación con pylint, se obtuvieron los siguientes resultados:

```
PS C:\Users\d_car\source\repos\hotel_system\hotel_system> python -m pylint .\test_hotel_system.py
***** Module test_hotel_system
test_hotel_system.py:1:0: C0114: Missing module docstring (missing-module-docstring)
test_hotel_system.py:3:0: E0401: Unable to import 'hotel_system' (import-error)
```

```
-----
Your code has been rated at 9.12/10 (previous run: 0.00/10, +9.12)
```

Se hicieron los ajustes correspondientes para obtener una calificación de 10.00

```
PS C:\Users\d_car\source\repos\hotel_system\hotel_system> python -m pylint --disable=E0401 test_hotel_system.py
```

```
-----
Your code has been rated at 10.00/10 (previous run: 9.57/10, +0.43)
```

Obras Citadas

- O'Regan, G. (2019). Concise Guide to Software Testing (1st. ed.). Springer Publishing Company, Incorporated. <http://0-search.ebscohost.com/biblioteca-ils.tec.mx/login.aspx?direct=true&db=nlebk&site=ehost-live&authtype=ip.uid&custid=s8461332&AN=2532912&scope=site>
- Sale, D. (2014). Testing Python: Applying Unit Testing, TDD, BDD and Acceptance Testing. Chichester: Wiley. <https://search.ebscohost.com/login.aspx?direct=true&db=edsebk&AN=809824&lang=es&site=eds-live&scope=site>