



Tecnológico de Monterrey

Instituto Tecnológico y de Estudios Superiores de Monterrey
Campus Guadalajara

Maestría en Ciencias de la Computación

TC4002.1 Análisis, diseño y construcción de software
Dr. Gerardo Padilla Zarate

Nombre: Héctor Gabriel Olagues Torres

Matrícula: A00354877

Marzo de 2021

Lab 6.1 – Python Coverage and Style Check

Goal: The target of these exercises is to enable the student to practice and master programming skills during the course. In this case, the application of code coverage to measure the unit testing progress as well as the style check using known tools.

Instructions: For all your previous exercises, measure the coverage for your testing. Provide Screenshots for the measurements. Try to achieve at least 90% of Statement Coverage. Get style checking tool and modify your programs at most 2 issues in PEP8 using module pycodestyle. Provide Screenshots as evidence. Upload your modified code into your GitRepo.

Modules to use: coverage and pycodestyle

Evidence of code coverage

Exercise-1 from Lab1:

```
D:\Documents\Continental Docs\Master's Degree\MCC_GDL-ITESM\2nd_February-June_2021\TC4002.1 Análisis, diseño y construcción de softw
are\GitHub_repositories\TC4002_dev_exercises\Lab1\Exercise-1>coverage run findNumber.py
Exercise 1 - Find the number

Guess the number generated randomly. It should be between >= 1 and <= 30.
Please type the number: 15

Your guess was too high

Guess the number generated randomly. It should be between >= 1 and <= 30.
Please type the number: 9

Your guess was too low

Guess the number generated randomly. It should be between >= 1 and <= 30.
Please type the number: 10

Your guess was too low

Guess the number generated randomly. It should be between >= 1 and <= 30.
Please type the number: 11

Your guess was exactly right

Number of guesses the user has taken: 4

Press type any key to exit

D:\Documents\Continental Docs\Master's Degree\MCC_GDL-ITESM\2nd_February-June_2021\TC4002.1 Análisis, diseño y construcción de softw
are\GitHub_repositories\TC4002_dev_exercises\Lab1\Exercise-1>coverage report
Name           Stmts  Miss  Cover
-----
findNumber.py   27      2    93%
TOTAL           27      2    93%
```

Exercise-2 from Lab1:

Original code

```

D:\Documents\Continental Docs\Master's Degree\MCC_GDL-ITESM\2nd_February-June_2021\TC4002.1 Análisis, diseño y construcción de software\GitHub_repositories\TC4002_dev_exercises\Lab1\Exercise-2>coverage run convert2X.py
Exercise 2 - CONVERTER

Please type a positive integer number, including zero: 158

Input value parameter in Binary:
10011110

Input value parameter in Hexadecimal:
0x9E

Press type any key to exit

D:\Documents\Continental Docs\Master's Degree\MCC_GDL-ITESM\2nd_February-June_2021\TC4002.1 Análisis, diseño y construcción de software\GitHub_repositories\TC4002_dev_exercises\Lab1\Exercise-2>coverage report
Name           Stmts   Miss  Cover
-----
convert2X.py    35      7    80%
TOTAL           35      7    80%

```

Modified code to achieve at least 90%

```

D:\Documents\Continental Docs\Master's Degree\MCC_GDL-ITESM\2nd_February-June_2021\TC4002.1 Análisis, diseño y construcción de software\GitHub_repositories\TC4002_dev_exercises\Lab1\Exercise-2>coverage run convert2X.py
Exercise 2 - CONVERTER

Test 1: Value -1

The input parameter does not contain only numeric digits

Test 2: Value 0

Input value parameter in Binary:
0

Input value parameter in Hexadecimal:
0x0

Test 3: Value 10

Input value parameter in Binary:
1010

Input value parameter in Hexadecimal:
0xA

Test 4: Value 11

Input value parameter in Binary:
1011

Input value parameter in Hexadecimal:
0xB

Test 5: Value 123456

Input value parameter in Binary:
11110001001000000

Input value parameter in Hexadecimal:
0x1E240

Press type any key to exit

D:\Documents\Continental Docs\Master's Degree\MCC_GDL-ITESM\2nd_February-June_2021\TC4002.1 Análisis, diseño y construcción de software\GitHub_repositories\TC4002_dev_exercises\Lab1\Exercise-2>coverage report
Name           Stmts   Miss  Cover
-----
convert2X.py    37      3    92%
TOTAL           37      3    92%

```

Exercise-3 from Lab1:

```
D:\Documents\Continental Docs\Master's Degree\MCC_GDL-ITESM\2nd_February-June_2021\TC4002.1 Análisis, diseño y construcción
de software\GitHub_repositories\TC4002_dev_exercises\Lab1\Exercise-3>coverage run findWords.py
Exercise 3 - COUNT WORDS

Please type the path and name of the file to be parsed: archivo_prueba1.txt

Please type the words to be counted, separated by a space:
hola él mio más la sin no hasta A de
{'hola': 0, 'él': 0, 'mio': 0, 'más': 0, 'la': 1, 'sin': 0, 'no': 1, 'hasta': 0, 'A': 1, 'de': 1}

Press type any key to exit

D:\Documents\Continental Docs\Master's Degree\MCC_GDL-ITESM\2nd_February-June_2021\TC4002.1 Análisis, diseño y construcción
de software\GitHub_repositories\TC4002_dev_exercises\Lab1\Exercise-3>coverage report
```

Name	Stmts	Miss	Cover
findWords.py	22	1	95%
TOTAL	22	1	95%

Exercise-4 from Lab2.1:

```
D:\Documents\Continental Docs\Master's Degree\MCC_GDL-ITESM\2nd_February-June_2021\TC4002.1 Análisis, diseño y construcción
de software\GitHub_repositories\TC4002_dev_exercises\Lab2.1\Exercise-4>coverage run 4_python_failing.py
int_to_str Test Cases (10):

Test 1: Value -1 converted in string: Not allowing negative numbers
Test 2: Value 0 converted in string: 0
Test 3: Value 1 converted in string: 1
Test 4: Value 5 converted in string: 5
Test 5: Value 12345 converted in string: 12345
Test 6: Value 98765 converted in string: 98765
Test 7: Value 4116 converted in string: 4116
Test 8: Value 6622 converted in string: 6622
Test 9: Value 999 converted in string: 999
Test 10: Value 13 converted in string: 13

str_to_int Test Cases (10):

Test 1: Value 0 converted to int: 0
Test 2: Value 1 converted to int: 1
Test 3: Value 26 converted to int: 26
Test 4: Value 536 converted to int: 536
Test 5: Value 000452 converted to int: 452
Test 6: Value 2626 converted to int: 2626
Test 7: Value 17771 converted to int: 17771
Test 8: Value 12677772234 converted to int: 12677772234
Test 9: Value 0101010 converted to int: 101010
Test 10: Value 999999 converted to int: 999999

D:\Documents\Continental Docs\Master's Degree\MCC_GDL-ITESM\2nd_February-June_2021\TC4002.1 Análisis, diseño y construcción
de software\GitHub_repositories\TC4002_dev_exercises\Lab2.1\Exercise-4>coverage report
```

Name	Stmts	Miss	Cover
4_python_failing.py	36	0	100%
TOTAL	36	0	100%

Exercise-5 from Lab2.1:

```
D:\Documents\Continental Docs\Master's Degree\MCC_GDL-ITESM\2nd_February-June_2021\TC4002.1 Análisis, diseño y
construcción de software\GitHub_repositories\TC4002_dev_exercises\Lab2.1\Exercise-5>coverage run 5_profit.py
#####
Cost price is lower than sell price:
Testcase: 1:
Input: {'cost_price': 0.0, 'sell_price': 2.0, 'inventory': 100}:
Output: 200

Testcase: 2:
Input: {'cost_price': 1.0, 'sell_price': 2.0, 'inventory': 100}:
Output: 100

Testcase: 3:
Input: {'cost_price': 32.67, 'sell_price': 45.0, 'inventory': 1200}:
Output: 14796
```

```
#####
Cost price is higher than sell price:
Testcase: 4:
Input: {'cost_price': 1, 'sell_price': 0.0, 'inventory': 1200}:
Output: -1200

Testcase: 5:
Input: {'cost_price': 2, 'sell_price': 0.0, 'inventory': 1200}:
Output: -2400

Testcase: 6:
Input: {'cost_price': 2, 'sell_price': 0.0, 'inventory': 1200}:
Output: -2400

#####
Cost price is the same as sell price:
Testcase: 7:
Input: {'cost_price': 65.2, 'sell_price': 65.2, 'inventory': 1000}:
Output: 0

Testcase: 8:
Input: {'cost_price': 65.2, 'sell_price': 65.2, 'inventory': 453}:
Output: 0

#####
No inventory:
Testcase: 9:
Input: {'cost_price': 100, 'sell_price': 1.0, 'inventory': 0}:
Output: 0

Testcase: 10:
Input: {'cost_price': 1.5, 'sell_price': 100.0, 'inventory': 0}:
Output: 0
```

```
D:\Documents\Continental Docs\Master's Degree\MCC_GDL-ITESM\2nd_February-June_2021\TC4002.1 Análisis, diseño y construcción de software\GitHub_repositories\TC4002_dev_exercises\Lab2.1\Exercise-5>coverage report
Name           Stmts   Miss  Cover
-----
5_profit.py      27      0   100%
TOTAL            27      0   100%
```

Exercises from Lab3.2:

```
D:\Documents\Continental Docs\Master's Degree\MCC_GDL-ITESM\2nd_February-June_2021\TC4002.1 Análisis, diseño y construcción de software\GitHub_repositories\TC4002_dev_exercises\Lab3.2>coverage run run_tests.py
test_different_content_no_shallow (test_filecmp_cmp.TestFilecmpCmp) ... ok
test_different_content_shallow (test_filecmp_cmp.TestFilecmpCmp) ... ok
test_same_content_no_shallow (test_filecmp_cmp.TestFilecmpCmp) ... ok
test_same_content_shallow (test_filecmp_cmp.TestFilecmpCmp) ... ok
test_almost_zero (test_math_ceil.TestMathCeil) ... ok
test_is_zero (test_math_ceil.TestMathCeil) ... ok
test_negative_number (test_math_ceil.TestMathCeil) ... ok
test_positive_number (test_math_ceil.TestMathCeil) ... ok
test_add_record (test_records_handler.TestRecordsHandler) ... ok
test_delete_record (test_records_handler.TestRecordsHandler) ... ok
test_list_all (test_records_handler.TestRecordsHandler) ... ok
test_look (test_records_handler.TestRecordsHandler) ... ok

-----
Ran 12 tests in 0.042s

OK

D:\Documents\Continental Docs\Master's Degree\MCC_GDL-ITESM\2nd_February-June_2021\TC4002.1 Análisis, diseño y construcción de software\GitHub_repositories\TC4002_dev_exercises\Lab3.2>coverage report
Name           Stmts   Miss  Cover
-----
run_tests.py      9      0   100%
src\__init__.py    0      0   100%
src\records_handler.py  74     14    81%
test\test_filecmp_cmp.py  23      0   100%
test\test_math_ceil.py  12      0   100%
test\test_records_handler.py  49      0   100%
TOTAL            167     14    92%
```

```
Coverage for src\records_handler.py : 81%
74 statements 60 run 14 missing 0 excluded

1 import sqlite3
2 from sqlite3 import Error
3
4
5 class RecordsHandler:
6     def __init__(self, db_file):
7         self.sql_create_projects_table = """ CREATE TABLE IF NOT EXISTS Records (
8             id integer PRIMARY KEY,
9             name text NOT NULL,
10            email text NOT NULL,
11            age text NOT NULL,
12            origin text NOT NULL
13        ); """
14
15        self.create_connection(db_file)
16
17    def create_connection(self, db_file):
18        """ create a database connection to a SQLite database """
19        self.conn = None
20        try:
21            self.conn = sqlite3.connect(db_file)
22        except Error as e:
23            print(e)
24
25        self.create_table(self.sql_create_projects_table)
26
27    def close_connection(self):
28        if self.conn:
29            self.conn.close()
30
31    def create_table(self, create_table_sql):
32        """create a table from the create_table_sql statement
33        :param conn: Connection object
34        :param create_table_sql: a CREATE TABLE statement
35        :return:
36        """
37        try:
38            c = self.conn.cursor()
39            c.execute(create_table_sql)
40            self.conn.commit()
41        except Error as e:
42            print(e)
43
44    def add_record(self, name="", email="", age="", origin=""):
45        sqlquery = "INSERT INTO Records (name, email, age, origin) VALUES ('%s', '%s', '%s', '%s')"
46        val = (name, email, age, origin)
47        query = sqlquery % val
48        try:
49            c = self.conn.cursor()
50            c.execute(query)
51            self.conn.commit()
52        except Error as e:
53            print(e)
54
55    def delete_record(self, record_id=-1):
56        sqlquery = "DELETE FROM Records WHERE id=%s"
57        val = record_id
58        query = sqlquery % val
59        try:
60            c = self.conn.cursor()
61            c.execute(query)
62            self.conn.commit()
63        except Error as e:
64            print(e)
65
66    def look(self, email="", age=""):
67        sqlquery = "SELECT * FROM Records WHERE email='%s' AND age='%s'"
68        val = (email, age)
69        query = sqlquery % val
70
71        results = []
72        try:
73            c = self.conn.cursor()
74            c.execute(query)
75            results.extend(c.fetchall())
76        except Error as e:
77            print(e)
78
79        return results
80
81    def list_all(self):
82        query = "SELECT * FROM Records"
83        results = []
84        try:
85            c = self.conn.cursor()
86            c.execute(query)
87            results.extend(c.fetchall())
88        except Error as e:
89            print(e)
90
91    # Loop through the rows
92    for row in results:
93        print(row)
94
95    def delete_all(self):
96        sqlquery = "DELETE FROM Records"
97        try:
98            c = self.conn.cursor()
99            c.execute(sqlquery)
100            self.conn.commit()
101        except Error as e:
102            print(e)
```

Note: The total Statement Coverage achieved was **92%**. However, there was **81%** achieved for **records_handler.py**. However, there is no way to modify the code for 90% achievement as not reached paths are exceptions from try statements, which will be executed only when there is a connection problem with the SQL database. These connection problems are hard to be triggered/reproduced during Unit Test. Therefore, it was decided that coverage achievement will be left as it is and no changes will be addressed in the original code.

Evidence of PEP8 style issues

Exercise-1 from Lab1:

Original code

```
D:\Documents\Continental Docs\Master's Degree\MCC_GDL-ITESM\2nd_February-June_2021\TC4002.1 Análisis, diseño y construcción de software\GitHub_repositories\TC4002_dev_exercises\Lab1\Exercise-1>pycodestyle --first findNumber.py
findNumber.py:2:1: E266 too many leading '#' for block comment
findNumber.py:32:80: E501 line too long (88 > 79 characters)
findNumber.py:53:53: E225 missing whitespace around operator
```

Modified code to solve at most 2 issues in PEP8

```
D:\Documents\Continental Docs\Master's Degree\MCC_GDL-ITESM\2nd_February-June_2021\TC4002.1 Análisis, diseño y construcción de software\GitHub_repositories\TC4002_dev_exercises\Lab1\Exercise-1>pycodestyle --first findNumber.py
findNumber.py:49:53: E225 missing whitespace around operator
```

Exercise-2 from Lab1:

Original code

```
D:\Documents\Continental Docs\Master's Degree\MCC_GDL-ITESM\2nd_February-June_2021\TC4002.1 Análisis, diseño y construcción de software\GitHub_repositories\TC4002_dev_exercises\Lab1\Exercise-2>pycodestyle --first convert2X.py
convert2X.py:2:1: E266 too many leading '#' for block comment
convert2X.py:23:1: W293 blank line contains whitespace
convert2X.py:25:1: E302 expected 2 blank lines, found 1
convert2X.py:54:80: E501 line too long (80 > 79 characters)
```

Modified code to solve at most 2 issues in PEP8

```
D:\Documents\Continental Docs\Master's Degree\MCC_GDL-ITESM\2nd_February-June_2021\TC4002.1 Análisis, diseño y construcción de software\GitHub_repositories\TC4002_dev_exercises\Lab1\Exercise-2>pycodestyle --first convert2X.py
convert2X.py:21:1: E302 expected 2 blank lines, found 1
convert2X.py:50:80: E501 line too long (80 > 79 characters)
```

Exercise-3 from Lab1:

Original code

```
D:\Documents\Continental Docs\Master's Degree\MCC_GDL-ITESM\2nd_February-June_2021\TC4002.1 Análisis, diseño y construcción de software\GitHub_repositories\TC4002_dev_exercises\Lab1\Exercise-3>pycodestyle --first findWords.py
findWords.py:2:1: E266 too many leading '#' for block comment
findWords.py:21:1: E265 block comment should start with '#'
findWords.py:22:1: E302 expected 2 blank lines, found 1
findWords.py:31:80: E501 line too long (81 > 79 characters)
```

Modified code to solve at most 2 issues in PEP8

```
D:\Documents\Continental Docs\Master's Degree\MCC_GDL-ITESM\2nd_February-June_2021\TC4002.1 Análisis, diseño y construcción de software\GitHub_repositories\TC4002_dev_exercises\Lab1\Exercise-3>pycodestyle --first findWords.py
findWords.py:19:1: E302 expected 2 blank lines, found 1
findWords.py:28:80: E501 line too long (81 > 79 characters)
```

Exercise-4 from Lab2.1:

Original code

```
D:\Documents\Continental Docs\Master's Degree\MCC_GDL-ITESM\2nd_February-June_2021\TC4002.1 Análisis, diseño y construcción de software\GitHub_repositories\TC4002_dev_exercises\Lab2.1\Exercise-4>pycodestyle --first 4_python_failing.py
4_python_failing.py:6:22: E231 missing whitespace after ','
4_python_failing.py:8:1: E302 expected 2 blank lines, found 1
4_python_failing.py:9:3: E111 indentation is not a multiple of four
4_python_failing.py:19:14: E222 multiple spaces after operator
4_python_failing.py:25:34: W291 trailing whitespace
4_python_failing.py:32:1: E305 expected 2 blank lines after class or function definition, found 1
4_python_failing.py:41:80: E501 line too long (84 > 79 characters)
```

Modified code to solve at most 2 issues in PEP8

```
D:\Documents\Continental Docs\Master's Degree\MCC_GDL-ITESM\2nd_February-June_2021\TC4002.1 Análisis, diseño y construcción de software\GitHub_repositories\TC4002_dev_exercises\Lab2.1\Exercise-4>pycodestyle --first 4_python_failing.py
4_python_failing.py:10:3: E111 indentation is not a multiple of four
4_python_failing.py:20:14: E222 multiple spaces after operator
4_python_failing.py:24:1: E302 expected 2 blank lines, found 1
4_python_failing.py:26:34: W291 trailing whitespace
4_python_failing.py:43:80: E501 line too long (84 > 79 characters)
```

Exercise-5 from Lab2.1:

Original code

```
D:\Documents\Continental Docs\Master's Degree\MCC_GDL-ITESM\2nd_February-June_2021\TC4002.1 Análisis, diseño y construcción de software\GitHub_repositories\TC4002_dev_exercises\Lab2.1\Exercise-5>pycodestyle --first 5_profit.py
5_profit.py:7:1: W191 indentation contains tabs
5_profit.py:10:1: E305 expected 2 blank lines after class or function definition, found 1
5_profit.py:11:21: E231 missing whitespace after ','
5_profit.py:35:1: E302 expected 2 blank lines, found 1
```

Modified code to solve at most 2 issues in PEP8

```
D:\Documents\Continental Docs\Master's Degree\MCC_GDL-ITESM\2nd_February-June_2021\TC4002.1 Análisis, diseño y construcción de software\GitHub_repositories\TC4002_dev_exercises\Lab2.1\Exercise-5>pycodestyle --first 5_profit.py
5_profit.py:7:80: E501 line too long (80 > 79 characters)
5_profit.py:12:24: E231 missing whitespace after ','
```

Exercises from Lab3.2:

records_handler.py

Original code

```
D:\Documents\Continental Docs\Master's Degree\MCC_GDL-ITESM\2nd_February-June_2021\TC4002.1 Análisis, diseño y construcción de software\GitHub_repositories\TC4002_dev_exercises\Lab3.2\src>pycodestyle --first records_handler.py
records_handler.py:7:80: E501 line too long (81 > 79 characters)
records_handler.py:94:1: W293 blank line contains whitespace
```

Modified code to solve at most 2 issues in PEP8

```
D:\Documents\Continental Docs\Master's Degree\MCC_GDL-ITESM\2nd_February-June_2021\TC4002.1 Análisis, diseño y construcción de software\GitHub_repositories\TC4002_dev_exercises\Lab3.2\src>pycodestyle --first records_handler.py
records_handler.py:7:80: E501 line too long (81 > 79 characters)
```

test_filecmp_cmp.py

Original code

```
D:\Documents\Continental Docs\Master's Degree\MCC_GDL-ITESM\2nd_February-June_2021\TC4002.1 Análisis, diseño y construcción de software\GitHub_repositories\TC4002_dev_exercises\Lab3.2\test>pycodestyle --first test_filecmp_cmp.py
test_filecmp_cmp.py:6:80: E501 line too long (87 > 79 characters)
test_filecmp_cmp.py:8:1: E302 expected 2 blank lines, found 1
```

Modified code to solve at most 2 issues in PEP8

```
D:\Documents\Continental Docs\Master's Degree\MCC_GDL-ITESM\2nd_February-June_2021\TC4002.1 Análisis, diseño y construcción de software\GitHub_repositories\TC4002_dev_exercises\Lab3.2\test>pycodestyle --first test_filecmp_cmp.py
test_filecmp_cmp.py:11:80: E501 line too long (83 > 79 characters)
```

test_math_ceil.py

Original code

```
D:\Documents\Continental Docs\Master's Degree\MCC_GDL-ITESM\2nd_February-June_2021\TC4002.1 Análisis, diseño y construcción de software\GitHub_repositories\TC4002_dev_exercises\Lab3.2\test>pycodestyle --first test_math_ceil.py
test_math_ceil.py:6:80: E501 line too long (87 > 79 characters)
test_math_ceil.py:8:1: E302 expected 2 blank lines, found 1
```

Modified code to solve at most 2 issues in PEP8

```
D:\Documents\Continental Docs\Master's Degree\MCC_GDL-ITESM\2nd_February-June_2021\TC4002.1 Análisis, diseño y construcción de software\GitHub_repositories\TC4002_dev_exercises\Lab3.2\test>pycodestyle --first test_math_ceil.py
```

test_records_handler.py

Original code

```
D:\Documents\Continental Docs\Master's Degree\MCC_GDL-ITESM\2nd_February-June_2021\TC4002.1 Análisis, diseño y construcción de software\GitHub_repositories\TC4002_dev_exercises\Lab3.2\test>pycodestyle --first test_records_handler.py
test_records_handler.py:11:80: E501 line too long (87 > 79 characters)
test_records_handler.py:13:1: E302 expected 2 blank lines, found 1
```

Modified code to solve at most 2 issues in PEP8

```
D:\Documents\Continental Docs\Master's Degree\MCC_GDL-ITESM\2nd_February-June_2021\TC4002.1 Análisis, diseño y construcción de software\GitHub_repositories\TC4002_dev_exercises\Lab3.2\test>pycodestyle --first test_records_handler.py
test_records_handler.py:36:80: E501 line too long (80 > 79 characters)
```

run_tests.py

Original code

```
D:\Documents\Continental Docs\Master's Degree\MCC_GDL-ITESM\2nd_February-June_2021\TC4002.1 Análisis, diseño y construcción de software\GitHub_repositories\TC4002_dev_exercises\Lab3.2>pycodestyle --first run_tests.py
run_tests.py:5:80: E501 line too long (86 > 79 characters)
run_tests.py:12:18: W292 no newline at end of file
```

Modified code to solve at most 2 issues in PEP8

```
D:\Documents\Continental Docs\Master's Degree\MCC_GDL-ITESM\2nd_February-June_2021\TC4002.1 Análisis, diseño y construcción de software\GitHub_repositories\TC4002_dev_exercises\Lab3.2>pycodestyle --first run_tests.py
run_tests.py:5:80: E501 line too long (86 > 79 characters)
```

Link to the GitHub Repo

https://github.com/hectorolagues/TC4002_dev_exercises