

These questions are provided in the **Codio workspace** – Testing with Python – where the activities should be completed.

Question 1

Run styleLint.py in Codio.

What happens when the code is run?

```
codio@panamasamuel-soundlocate:~/workspace$ python3
styleLint.py
  File "styleLint.py", line 2
    """ Return factorial of n """
                                ^
IndentationError: expected an indented block
codio@panamasamuel-soundlocate:~/workspace$
```

The code presented an indentation error which I corrected.

Can you modify this code for a more favourable outcome? What amendments have you made to the code?

I amended the code as stilelint2.py and it return an error message if n is less than zero, moreover when asking to insert a number, the input accepts only integers.

Question 2

pip install pylint

Run

pylint

on pylintTest.py

Review each of the code errors returned. Can you correct each of the errors identified by pylint?

The review on the code came with the following outputs:

```

***** Module pylintTest
C0303:trailing-whitespace: 13,0: Trailing whitespace
W0311:bad-indentation: 20,0: Bad indentation. Found 2 spaces, expected 4
W0311:bad-indentation: 21,0: Bad indentation. Found 4 spaces, expected 8
W0311:bad-indentation: 22,0: Bad indentation. Found 6 spaces, expected 12
W0311:bad-indentation: 23,0: Bad indentation. Found 4 spaces, expected 8
W0311:bad-indentation: 24,0: Bad indentation. Found 6 spaces, expected 12
W0311:bad-indentation: 25,0: Bad indentation. Found 6 spaces, expected 12
W0311:bad-indentation: 26,0: Bad indentation. Found 4 spaces, expected 8
W0311:bad-indentation: 27,0: Bad indentation. Found 6 spaces, expected 12
W0311:bad-indentation: 28,0: Bad indentation. Found 8 spaces, expected 16
W0311:bad-indentation: 29,0: Bad indentation. Found 12 spaces, expected 20
W0311:bad-indentation: 30,0: Bad indentation. Found 8 spaces, expected 16
W0311:bad-indentation: 31,0: Bad indentation. Found 10 spaces, expected 20
W0311:bad-indentation: 32,0: Bad indentation. Found 10 spaces, expected 20
C0304:missing-final-newline: 34,0: Final newline missing
C0103:invalid-name: 1,0: Module name "pylintTest" doesn't conform to snake_case naming style
C0103:invalid-name: 14,0: Constant name "shift" doesn't conform to UPPER_CASE naming style
E0602:undefined-variable: 15,9: Undefined variable 'raw_input'
E0602:undefined-variable: 16,8: Undefined variable 'raw_input'
C0103:invalid-name: 17,0: Constant name "letters" doesn't conform to UPPER_CASE naming style
C0103:invalid-name: 18,0: Constant name "encoded" doesn't conform to UPPER_CASE naming style
C0103:invalid-name: 22,6: Constant name "encoded" doesn't conform to UPPER_CASE naming style
C0103:invalid-name: 24,6: Constant name "x" doesn't conform to UPPER_CASE naming style
C0103:invalid-name: 25,6: Constant name "encoded" doesn't conform to UPPER_CASE naming style
W0621:redefined-outer-name: 27,6: Redefining name 'letter' from outer scope (line 20)
C0103:invalid-name: 29,12: Constant name "encoded" doesn't conform to UPPER_CASE naming style
C0103:invalid-name: 31,10: Constant name "x" doesn't conform to UPPER_CASE naming style
C0103:invalid-name: 32,10: Constant name "encoded" doesn't conform to UPPER_CASE naming style

-----
Your code has been rated at -8.95/10 (previous run: -8.95/10, +0.00)

```

After correcting all the errors this was the result of the of the code analysis

The screenshot shows the Spyder Python IDE interface. The left pane displays a Python script named `pylintTest2.py` with the following content:

```

1  """
2  Created on Sun Aug 28 18:08:11 2022
3
4  @author: robertocappiello
5  """
6
7
8  # SOURCE OF CODE: https://docs.pylint.org/en/1.6.0/tutorial.html
9
10 import string
11 SHIFT = 3
12 choice = input("would you like to encode or decode?")
13 word = input("Please enter text")
14 LETTERS = string.ascii_letters + string.punctuation + string.digits
15 ENCODED = ''
16 if choice == "encode":
17     for letter in word:
18         if letter == ' ':
19             ENCODED = ENCODED + ' '
20         else:
21             X = LETTERS.index(letter) + SHIFT
22             ENCODED = ENCODED + LETTERS[X]
23 if choice == "decode":
24     for letter in word:
25         if letter == ' ':
26             ENCODED = ENCODED + ' '
27         else:
28             X = LETTERS.index(letter) - SHIFT
29             ENCODED = ENCODED + LETTERS[X]
30
31 print (ENCODED)
32

```

The right-hand panel shows the results of the code analysis. At the top, it displays a "Global evaluation: 9.47/10" and the date "2022-08-28 19:01:26". Below this, it shows the file path and a "Code Analysis" tab. The "Console 2/A" pane shows the output of the script:

```

Python 3.8.8 (default, Apr 13 2021, 12:59:45)
Type "copyright", "credits" or "license" for more information.

IPython 7.22.0 -- An enhanced Interactive Python.
Restarting kernel...

runfile('/Users/robertocappiello/Documents/University of Essex/Secure Software Development/Codio exercise/pylintTest2.py', wdir='/Users/robertocappiello/Documents/University of Essex/Secure Software Development/Codio exercise')

In [1]:
would you like to encode or decode?

```

/Secure Software Development/Codio exercise/pylintTest2.py

Analyze

Stop

Global evaluation: 9.47/10

2022-08-28 19:01:26

Output

Results for /Users/robertocappiello/Documents/University of Essex/Secure Software Development/Codio exer

Question 3

pip install flake8

Run

flake8

on pylintTest.py

Review the errors returned. In what way does this error message differ from the error message returned by pylint?

Flake8 test doesn't return error message about line 26 where encoded is not in the ().

```
codio@panamasamuel-soundlocate:~/workspace$ flake8 pylintTest.py
pylintTest.py:5:1: W293 blank line contains whitespace
pylintTest.py:12:3: E111 indentation is not a multiple of 4
pylintTest.py:14:7: E111 indentation is not a multiple of 4
pylintTest.py:16:7: E111 indentation is not a multiple of 4
pylintTest.py:17:7: E111 indentation is not a multiple of 4
pylintTest.py:17:14: E225 missing whitespace around operator
pylintTest.py:19:7: E111 indentation is not a multiple of 4
pylintTest.py:23:11: E111 indentation is not a multiple of 4
pylintTest.py:24:11: E111 indentation is not a multiple of 4
pylintTest.py:26:14: W292 no newline at end of file
codio@panamasamuel-soundlocate:~/workspace$ flake8 pylintTest.py
pylintTest.py:17:20: E225 missing whitespace around operator
codio@panamasamuel-soundlocate:~/workspace$
```

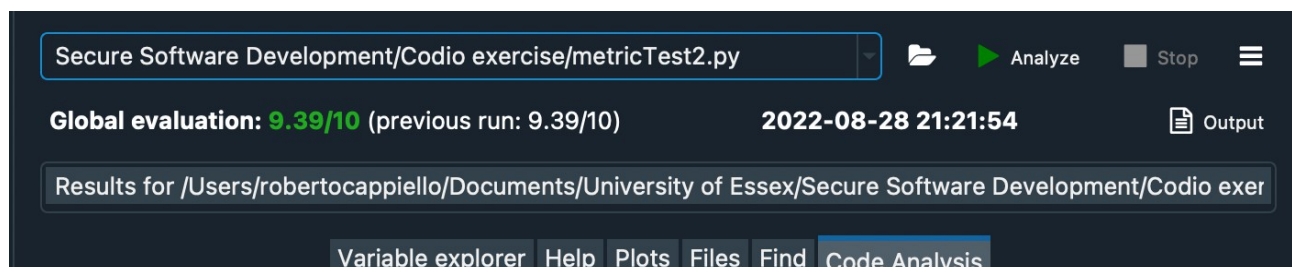
pylint test is more detailed

Run flake8 on metricTest.py. Can you correct each of the errors returned by flake8? What amendments have you made to the code?

```
codio@panamasamuel-soundlocate:~/workspace$ flake8 metricTest.py
metricTest.py:2:1: E265 block comment should start with '# '
metricTest.py:2:48: W291 trailing whitespace
metricTest.py:13:8: E999 SyntaxError: invalid syntax
metricTest.py:16:1: E112 expected an indented block
metricTest.py:20:1: E128 continuation line under-indented for visual inden
t
metricTest.py:21:1: E128 continuation line under-indented for visual inden
t
metricTest.py:22:1: E128 continuation line under-indented for visual inden
t
metricTest.py:23:1: E112 expected an indented block
metricTest.py:27:8: E225 missing whitespace around operator
metricTest.py:28:1: E112 expected an indented block
metricTest.py:30:3: E261 at least two spaces before inline comment
metricTest.py:31:8: E225 missing whitespace around operator
metricTest.py:31:17: E225 missing whitespace around operator
metricTest.py:32:1: E112 expected an indented block
metricTest.py:34:3: E261 at least two spaces before inline comment
metricTest.py:34:80: E501 line too long (83 > 79 characters)
metricTest.py:35:2: E201 whitespace after '['
metricTest.py:35:5: E202 whitespace before ']'
metricTest.py:36:8: E225 missing whitespace around operator
metricTest.py:37:1: E112 expected an indented block
metricTest.py:37:8: E225 missing whitespace around operator
metricTest.py:38:1: E112 expected an indented block
metricTest.py:38:3: E261 at least two spaces before inline comment
metricTest.py:39:22: E231 missing whitespace after ','
metricTest.py:40:10: E225 missing whitespace around operator
metricTest.py:41:1: E112 expected an indented block
metricTest.py:41:3: E261 at least two spaces before inline comment
metricTest.py:42:35: E231 missing whitespace after ','
metricTest.py:42:45: E231 missing whitespace after ','
metricTest.py:43:1: E128 continuation line under-indented for visual inden
t
metricTest.py:44:1: E128 continuation line under-indented for visual inden
```

```
metricTest.py:45:10: E225 missing whitespace around operator
metricTest.py:46:1: E112 expected an indented block
metricTest.py:46:3: E261 at least two spaces before inline comment
metricTest.py:48:1: E128 continuation line under-indented for visual inden
t
metricTest.py:52:1: E112 expected an indented block
metricTest.py:54:24: E231 missing whitespace after ','
metricTest.py:55:1: E112 expected an indented block
metricTest.py:59:1: E112 expected an indented block
metricTest.py:62:1: E112 expected an indented block
metricTest.py:63:13: E225 missing whitespace around operator
metricTest.py:64:1: E112 expected an indented block
metricTest.py:65:10: E225 missing whitespace around operator
metricTest.py:66:1: E112 expected an indented block
metricTest.py:66:12: E225 missing whitespace around operator
metricTest.py:69:1: E112 expected an indented block
metricTest.py:72:1: E112 expected an indented block
metricTest.py:74:17: E231 missing whitespace after ','
metricTest.py:75:1: E112 expected an indented block
metricTest.py:75:8: E225 missing whitespace around operator
metricTest.py:76:1: E112 expected an indented block
metricTest.py:77:8: E231 missing whitespace after ':'
metricTest.py:78:2: E201 whitespace after '['
metricTest.py:78:5: E202 whitespace before ']'
metricTest.py:82:1: E112 expected an indented block
metricTest.py:83:13: E225 missing whitespace around operator
metricTest.py:84:1: E112 expected an indented block
metricTest.py:86:1: E112 expected an indented block
metricTest.py:86:19: W292 no newline at end of file
codio@panamasamuel-soundlocate:~/workspace$
```

After modifying the code in metricTest2 I received the following code analysis result



The screenshot shows the Codio IDE interface. At the top, the file path is 'Secure Software Development/Codio exercise/metricTest2.py'. Below this, the 'Global evaluation' is shown as '9.39/10' (previous run: 9.39/10) with a timestamp of '2022-08-28 21:21:54'. A button labeled 'Output' is visible. The main area displays 'Results for /Users/robertocappiello/Documents/University of Essex/Secure Software Development/Codio exer'. At the bottom, there are tabs for 'Variable explorer', 'Help', 'Plots', 'Files', 'Find', and 'Code Analysis', with 'Code Analysis' being the active tab.

Question 4

pip install mccabe

Run

mccabe

on sums.py. What is the result?

```
codio@panamasamuel-soundlocate:~/workspace$ python -m mccabe sums.py
("4:0: 'test_sum'", 1)
('If 7', 2)
```

Run

mccabe

on sums2.py. What is the result?

```
codio@panamasamuel-soundlocate:~/workspace$ python -m mccabe sums2.py
("7:0: 'test_sum_tuple'", 1)
("4:0: 'test_sum'", 1)
('If 10', 2)
```

What are the contributors to the cyclomatic complexity in each piece of code?