



Tecnológico de Monterrey

Instituto Tecnológico y de Estudios Superiores de Monterrey

Escuela de Ingeniería y Ciencias
Maestría en Inteligencia Artificial Aplicada

Actividad 4.2 Ejercicio de programación 1

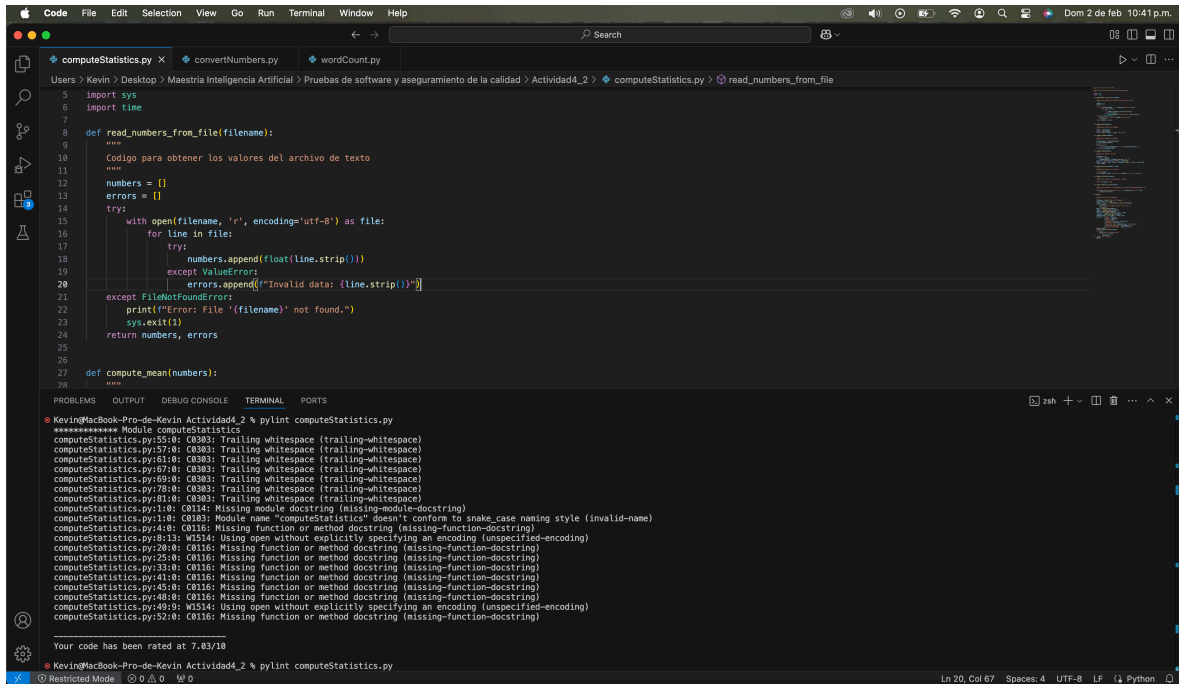
Pruebas de software y aseguramiento de la calidad

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Problema 1: ComputeStatistics.py

Evidencia de ejecución de código en Pylint:



```
computeStatistics.py
5 import sys
6 import time
7
8 def read_numbers_from_file(filename):
9     """
10     Código para obtener los valores del archivo de texto
11     """
12     numbers = []
13     errors = []
14     try:
15         with open(filename, 'r', encoding='utf-8') as file:
16             for line in file:
17                 try:
18                     numbers.append(float(line.strip()))
19                 except ValueError:
20                     errors.append(f"Invalid data: {line.strip()}")
21     except FileNotFoundError:
22         print(f"Error: File '{filename}' not found.")
23         sys.exit(1)
24     return numbers, errors
25
26
27 def compute_mean(numbers):
28     """
29     """
30     return sum(numbers) / len(numbers)
31
32
33 if __name__ == '__main__':
34     filename = 'data.txt'
35     numbers, errors = read_numbers_from_file(filename)
36     mean = compute_mean(numbers)
37     print(f"Mean: {mean}")
38     for error in errors:
39         print(error)
```

```
Kevin@MacBook-Pro-de-Kevin Actividad4_2 % pylint computeStatistics.py
***** Module computeStatistics
computeStatistics.py:55:0: C0303: Trailing whitespace (trailing-whitespace)
computeStatistics.py:57:0: C0303: Trailing whitespace (trailing-whitespace)
computeStatistics.py:61:0: C0303: Trailing whitespace (trailing-whitespace)
computeStatistics.py:67:0: C0303: Trailing whitespace (trailing-whitespace)
computeStatistics.py:69:0: C0303: Trailing whitespace (trailing-whitespace)
computeStatistics.py:78:0: C0303: Trailing whitespace (trailing-whitespace)
computeStatistics.py:81:0: C0303: Trailing whitespace (trailing-whitespace)
computeStatistics.py:1:0: C0114: Missing module docstring (missing-module-docstring)
computeStatistics.py:1:0: C0103: Module name "computeStatistics" doesn't conform to snake_case naming style (invalid-name)
computeStatistics.py:4:0: C0116: Missing function or method docstring (missing-function-docstring)
computeStatistics.py:8:13: W1514: Using open without explicitly specifying an encoding (unspecified-encoding)
computeStatistics.py:20:0: C0116: Missing function or method docstring (missing-function-docstring)
computeStatistics.py:33:0: C0116: Missing function or method docstring (missing-function-docstring)
computeStatistics.py:41:0: C0116: Missing function or method docstring (missing-function-docstring)
computeStatistics.py:43:0: C0116: Missing function or method docstring (missing-function-docstring)
computeStatistics.py:48:0: C0116: Missing function or method docstring (missing-function-docstring)
computeStatistics.py:49:0: W1514: Using open without explicitly specifying an encoding (unspecified-encoding)
computeStatistics.py:50:0: C0116: Missing function or method docstring (missing-function-docstring)

Your code has been rated at 7.83/10
```

Errores mostrados y corregidos:

```
***** Module computeStatistics
computeStatistics.py:55:0: C0303: Trailing whitespace (trailing-whitespace)
computeStatistics.py:57:0: C0303: Trailing whitespace (trailing-whitespace)
computeStatistics.py:61:0: C0303: Trailing whitespace (trailing-whitespace)
computeStatistics.py:67:0: C0303: Trailing whitespace (trailing-whitespace)
computeStatistics.py:69:0: C0303: Trailing whitespace (trailing-whitespace)
computeStatistics.py:78:0: C0303: Trailing whitespace (trailing-whitespace)
computeStatistics.py:81:0: C0303: Trailing whitespace (trailing-whitespace)
computeStatistics.py:1:0: C0114: Missing module docstring (missing-module-docstring)
computeStatistics.py:1:0: C0103: Module name "computeStatistics" doesn't conform to snake_case naming style (invalid-name)
computeStatistics.py:4:0: C0116: Missing function or method docstring (missing-function-docstring)
computeStatistics.py:8:13: W1514: Using open without explicitly specifying an encoding (unspecified-encoding)
computeStatistics.py:20:0: C0116: Missing function or method docstring (missing-function-docstring)
computeStatistics.py:25:0: C0116: Missing function or method docstring (missing-function-docstring)
```

computeStatistics.py:33:0: C0116: Missing function or method docstring (missing-function-docstring)
computeStatistics.py:41:0: C0116: Missing function or method docstring (missing-function-docstring)
computeStatistics.py:45:0: C0116: Missing function or method docstring (missing-function-docstring)
computeStatistics.py:48:0: C0116: Missing function or method docstring (missing-function-docstring)
computeStatistics.py:49:9: W1514: Using open without explicitly specifying an encoding (unspecified-encoding)
computeStatistics.py:52:0: C0116: Missing function or method docstring (missing-function-docstring)

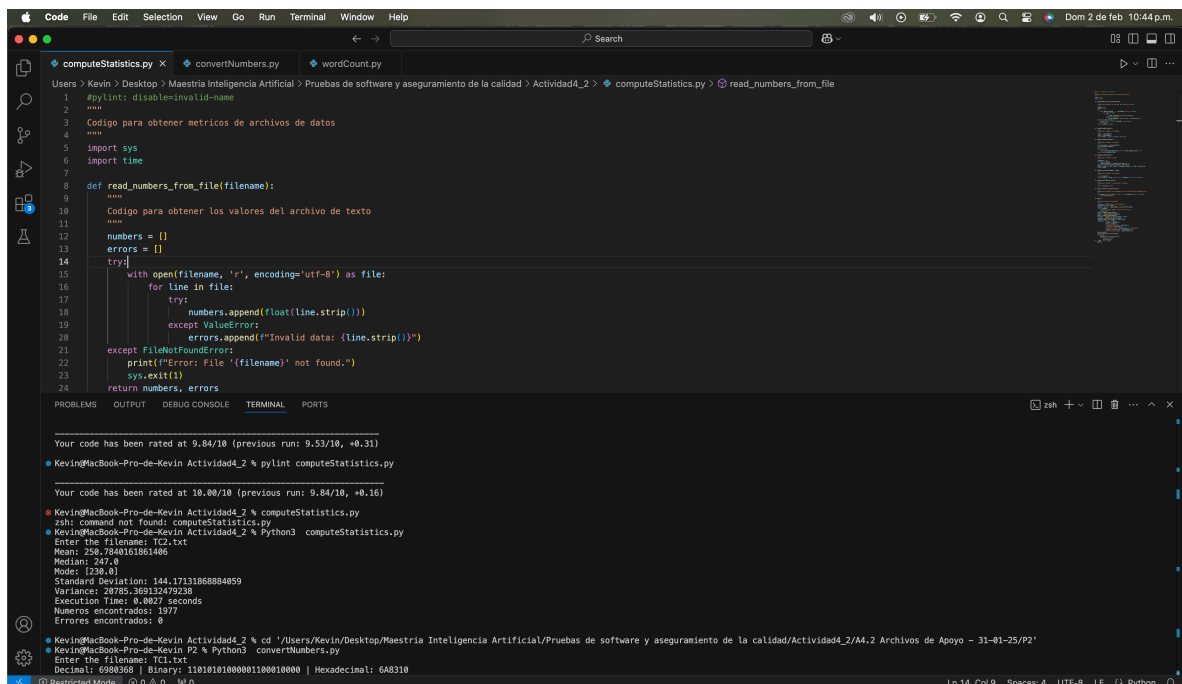
Your code has been rated at 7.03/10

Nota importante: El error:

“computeStatistics.py:1:0: C0103: Module name "computeStatistics" doesn't conform to snake_case naming style (invalid-name)”

Fue omitido con el código: #pylint: disable=invalid-name debido a que las instrucciones solicitaban ese nombre.

Evidencia de funcionamiento de código una vez corregidos los errores:



The screenshot shows a code editor with a Python script named `computeStatistics.py`. The script is designed to read numbers from a file and calculate statistical metrics. The code includes comments in Spanish and uses a try-except block to handle file-related errors. The terminal output shows the execution of the script, which successfully reads data from `TC2.txt` and calculates the mean, median, mode, standard deviation, and variance. The output also includes the execution time and the number of errors found (0).

```
1 #pylint: disable=invalid-name
2 """
3 Código para obtener metodos de archivos de datos
4 """
5 import sys
6 import time
7
8 def read_numbers_from_file(filename):
9     """
10     Código para obtener los valores del archivo de texto
11     """
12     numbers = []
13     errors = []
14     try:
15         with open(filename, 'r', encoding='utf-8') as file:
16             for line in file:
17                 try:
18                     numbers.append(float(line.strip()))
19                 except ValueError:
20                     errors.append(f"Invalid data: {line.strip()}")
21     except FileNotFoundError:
22         print(f"Error: File '{filename}' not found.")
23         sys.exit(1)
24     return numbers, errors
25
26 if __name__ == '__main__':
27     filename = 'TC2.txt'
28     numbers, errors = read_numbers_from_file(filename)
29     if not numbers:
30         print("No numbers found in the file.")
31         sys.exit(1)
32     mean = sum(numbers) / len(numbers)
33     median = sorted(numbers)[len(numbers) // 2]
34     mode = max(set(numbers), key=numbers.count)
35     standard_deviation = ((sum((x - mean) ** 2) / len(numbers)) ** 0.5)
36     variance = standard_deviation ** 2
37     execution_time = time.time() - start_time
38     print(f"Mean: {mean}")
39     print(f"Median: {median}")
40     print(f"Mode: {mode}")
41     print(f"Standard Deviation: {standard_deviation}")
42     print(f"Variance: {variance}")
43     print(f"Execution Time: {execution_time} seconds")
44     print(f"Numbers encontrados: {len(numbers)}")
45     print(f"Errores encontrados: {len(errors)}")
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS

Your code has been rated at 9.84/10 (previous run: 9.53/10, +0.31)

Kevin@MacBook-Pro-de-Kevin Actividad4_2 % pylint computeStatistics.py

Your code has been rated at 10.00/10 (previous run: 9.84/10, +0.16)

Kevin@MacBook-Pro-de-Kevin Actividad4_2 % computeStatistics.py

zsh: command not found: computeStatistics.py

Kevin@MacBook-Pro-de-Kevin Actividad4_2 % python3 computeStatistics.py

Enter the filename: TC2.txt

Mean: 258.7840161861486

Median: 247.0

Mode: [230.0]

Standard Deviation: 144.17131868884059

Variance: 20785.369132479238

Execution Time: 0.0027 seconds

Numbers encontrados: 1077

Errores encontrados: 0

Kevin@MacBook-Pro-de-Kevin Actividad4_2 % cd '/Users/Kevin/Desktop/Maestria Inteligencia Artificial/Pruebas de software y aseguramiento de la calidad/Actividad4_2/4.2 Archivos de Apoyo - 31-01-25/P2'

Kevin@MacBook-Pro-de-Kevin P2 % python3 convertNumbers.py

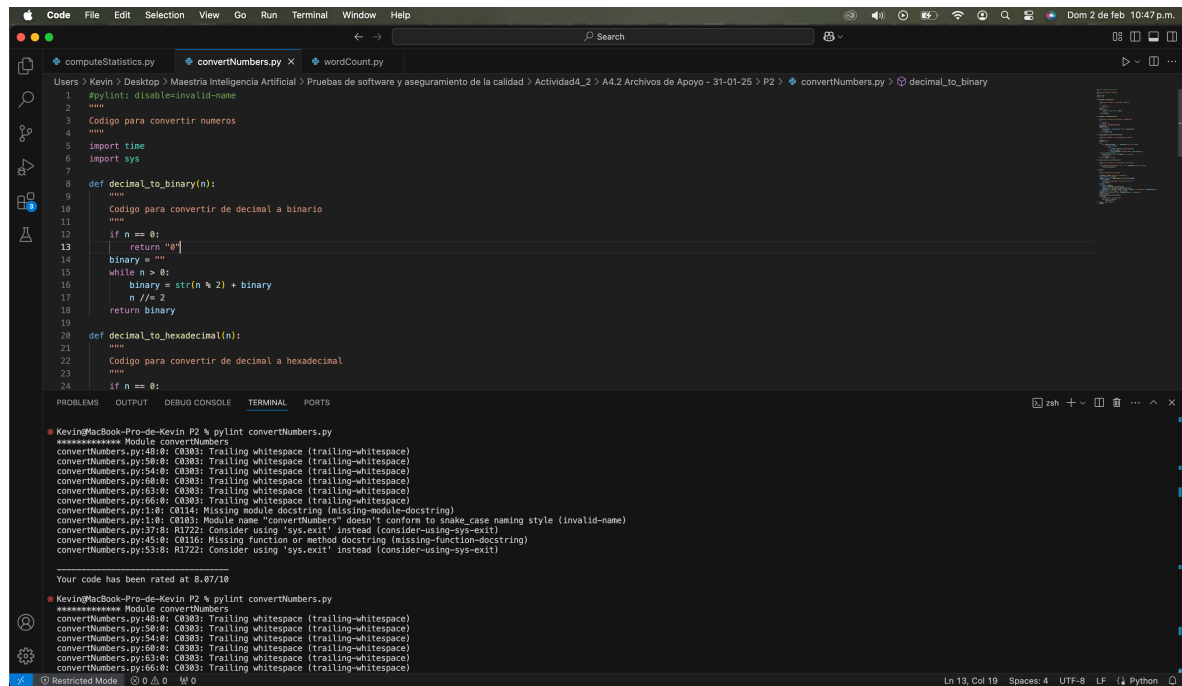
Enter the filename: TC1.txt

Decimal: 6988368 | Binary: 1101010100001100010000 | Hexadecimal: 6A8310

Ln 14, Col 9 Spaces: 4 UTF-8 LF Python

Problema 2 convertNumbers.py

Evidencia de ejecución de código en Pylint:



```
1 #pylint: disable=invalid-name
2 """
3 Codigo para convertir numeros
4 """
5 import time
6 import sys
7
8 def decimal_to_binary(n):
9     """
10     Codigo para convertir de decimal a binario
11     """
12     if n == 0:
13         return "0"
14     binary = ""
15     while n > 0:
16         binary = str(n % 2) + binary
17         n //= 2
18     return binary
19
20 def decimal_to_hexadecimal(n):
21     """
22     Codigo para convertir de decimal a hexadecimal
23     """
24     if n == 0:
25         return "0"
26     hexa = ""
27     while n > 0:
28         hexa = hex(n % 16) + hexa
29         n //= 16
30     return hexa
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS

```
Kevin@MacBook-Pro-de-Kevin P2 % pylint convertNumbers.py
***** Module convertNumbers
convertNumbers.py:48:0: C0303: Trailing whitespace (trailing-whitespace)
convertNumbers.py:50:0: C0303: Trailing whitespace (trailing-whitespace)
convertNumbers.py:54:0: C0303: Trailing whitespace (trailing-whitespace)
convertNumbers.py:58:0: C0303: Trailing whitespace (trailing-whitespace)
convertNumbers.py:63:0: C0303: Trailing whitespace (trailing-whitespace)
convertNumbers.py:66:0: C0303: Trailing whitespace (trailing-whitespace)
convertNumbers.py:1:0: C0114: Missing module docstring (missing-module-docstring)
convertNumbers.py:1:0: C0103: Module name "convertNumbers" doesn't conform to snake_case naming style (invalid-name)
convertNumbers.py:37:8: R1722: Consider using 'sys.exit' instead (consider-using-sys-exit)
convertNumbers.py:45:0: C0116: Missing function or method docstring (missing-function-docstring)
convertNumbers.py:53:8: R1722: Consider using 'sys.exit' instead (consider-using-sys-exit)

Your code has been rated at 8.07/10

Kevin@MacBook-Pro-de-Kevin P2 % pylint convertNumbers.py
***** Module convertNumbers
convertNumbers.py:48:0: C0303: Trailing whitespace (trailing-whitespace)
convertNumbers.py:50:0: C0303: Trailing whitespace (trailing-whitespace)
convertNumbers.py:54:0: C0303: Trailing whitespace (trailing-whitespace)
convertNumbers.py:58:0: C0303: Trailing whitespace (trailing-whitespace)
convertNumbers.py:63:0: C0303: Trailing whitespace (trailing-whitespace)
convertNumbers.py:66:0: C0303: Trailing whitespace (trailing-whitespace)
```

Errores mostrados y corregidos:

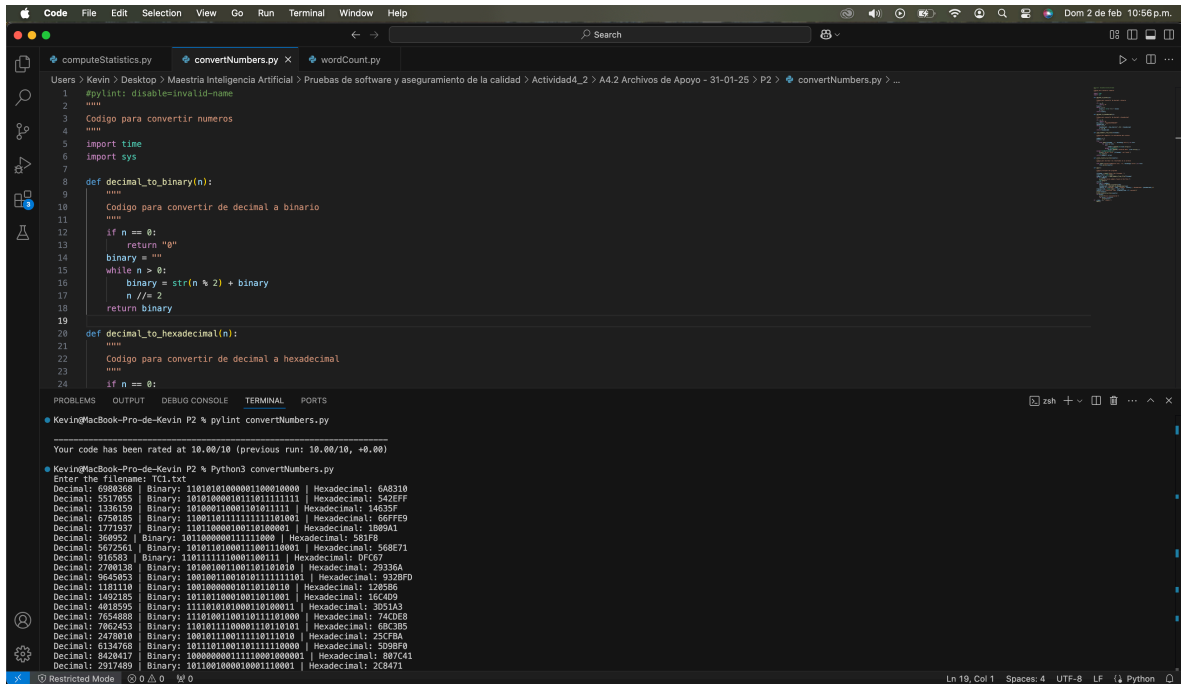
```
***** Module convertNumbers
convertNumbers.py:48:0: C0303: Trailing whitespace (trailing-whitespace)
convertNumbers.py:50:0: C0303: Trailing whitespace (trailing-whitespace)
convertNumbers.py:54:0: C0303: Trailing whitespace (trailing-whitespace)
convertNumbers.py:60:0: C0303: Trailing whitespace (trailing-whitespace)
convertNumbers.py:63:0: C0303: Trailing whitespace (trailing-whitespace)
convertNumbers.py:66:0: C0303: Trailing whitespace (trailing-whitespace)
convertNumbers.py:1:0: C0114: Missing module docstring (missing-module-docstring)
convertNumbers.py:1:0: C0103: Module name "convertNumbers" doesn't conform to
snake_case naming style (invalid-name)
convertNumbers.py:37:8: R1722: Consider using 'sys.exit' instead (consider-using-sys-exit)
convertNumbers.py:45:0: C0116: Missing function or method docstring (missing-function-
docstring)
convertNumbers.py:53:8: R1722: Consider using 'sys.exit' instead (consider-using-sys-exit)
```

Nota importante: El error:

```
convertNumbers.py:1:0: C0103: Module name "convertNumbers" doesn't conform to
snake_case naming style (invalid-name)
```

Fue omitido con el codigo: #pylint: disable=invalid-name debido a que las instrucciones solicitaban ese nombre.

Evidencia de funcionamiento de codigo una vez corregidos los errores:



The screenshot shows a code editor with a Python script named `convertNumbers.py`. The script defines two functions: `decimal_to_binary(n)` and `decimal_to_hexadecimal(n)`. The `decimal_to_binary` function uses a loop to convert a decimal number to its binary representation. The `decimal_to_hexadecimal` function is partially visible. Below the code editor, the terminal output shows the execution of the script, displaying a list of decimal numbers and their corresponding binary and hexadecimal representations.

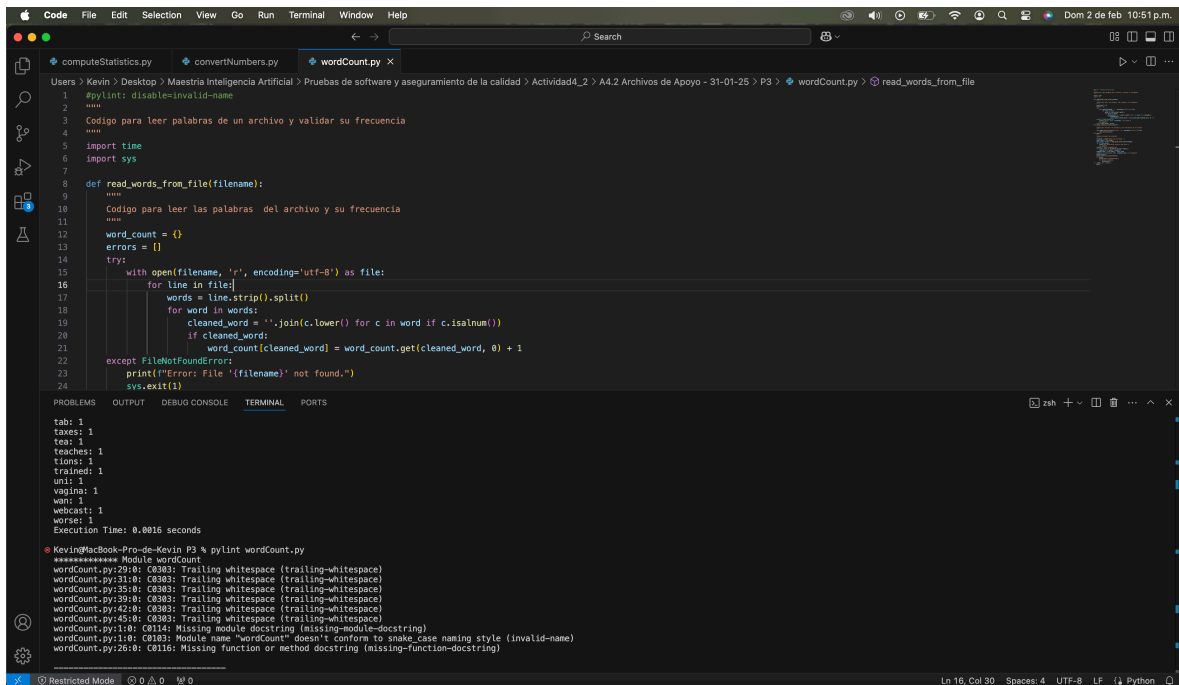
```
def decimal_to_binary(n):  
    """  
    Codigo para convertir de decimal a binario  
    """  
    if n == 0:  
        return "0"  
    binary = ""  
    while n > 0:  
        binary = str(n % 2) + binary  
        n //= 2  
    return binary  
  
def decimal_to_hexadecimal(n):  
    """  
    Codigo para convertir de decimal a hexadecimal  
    """  
    if n == 0:  
        return "0"  
    hexa = ""  
    while n > 0:  
        hexa = hex(n % 16) + hexa  
        n //= 16  
    return hexa
```

Output:

```
Enter the filename: 01.txt  
Decimal: 698958 | Binary: 110101000001100010000 | Hexadecimal: 6A8310  
Decimal: 551705 | Binary: 101010000101100111111 | Hexadecimal: 542EFF  
Decimal: 1320129 | Binary: 1010001100010101111 | Hexadecimal: 14635F  
Decimal: 6759185 | Binary: 11001101111111101001 | Hexadecimal: 66FF69  
Decimal: 1771937 | Binary: 110110000100110100001 | Hexadecimal: 1B85A1  
Decimal: 568652 | Binary: 101100000011111000 | Hexadecimal: 531F8  
Decimal: 5672561 | Binary: 1010110100011001110001 | Hexadecimal: 568E71  
Decimal: 916583 | Binary: 11011111000100111 | Hexadecimal: 91C57  
Decimal: 2700138 | Binary: 101001001100101101010 | Hexadecimal: 29336A  
Decimal: 9645853 | Binary: 10010011001010111111101 | Hexadecimal: 932BFD  
Decimal: 1101110 | Binary: 100100000010101010 | Hexadecimal: 129306  
Decimal: 1492185 | Binary: 10110110001001101001 | Hexadecimal: 16C4D9  
Decimal: 4816295 | Binary: 111101010100011010001 | Hexadecimal: 3D5A3  
Decimal: 7654880 | Binary: 1110100110011011101000 | Hexadecimal: 74C0E8  
Decimal: 7862453 | Binary: 110101110000110110101 | Hexadecimal: 68C3B5  
Decimal: 2478010 | Binary: 10010111001111011010 | Hexadecimal: 25CF8A  
Decimal: 6134768 | Binary: 10110110010111110000 | Hexadecimal: 5D98F0  
Decimal: 8420417 | Binary: 10000000011110001000001 | Hexadecimal: 807C41  
Decimal: 5211420 | Binary: 101100100010001110001 | Hexadecimal: 2C8771
```

Problema 3 wordCount.py

Evidencia de ejecución de código en Pylint:



Errores mostrados y corregidos:

Kevin@MacBook-Pro-de-Kevin P3 % pylint wordCount.py

***** Module wordCount

wordCount.py:29:0: C0303: Trailing whitespace (trailing-whitespace)

wordCount.py:31:0: C0303: Trailing whitespace (trailing-whitespace)

wordCount.py:35:0: C0303: Trailing whitespace (trailing-whitespace)

wordCount.py:39:0: C0303: Trailing whitespace (trailing-whitespace)

wordCount.py:42:0: C0303: Trailing whitespace (trailing-whitespace)

wordCount.py:45:0: C0303: Trailing whitespace (trailing-whitespace)

wordCount.py:1:0: C0114: Missing module docstring (missing-module-docstring)

wordCount.py:1:0: C0103: Module name "wordCount" doesn't conform to snake_case naming style (invalid-name)

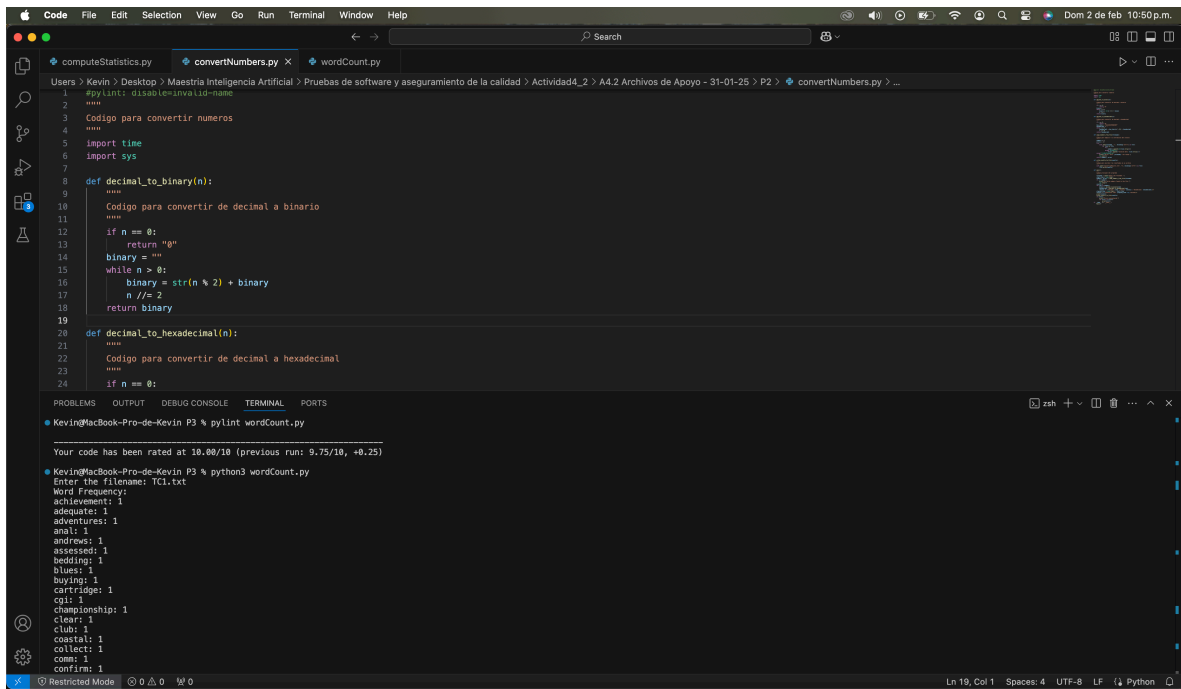
wordCount.py:26:0: C0116: Missing function or method docstring (missing-function-docstring)

Nota importante: El error:

wordCount.py:1:0: C0103: Module name "wordCount" doesn't conform to snake_case naming style (invalid-name)

Fue omitido con el código: `#pylint: disable=invalid-name` debido a que las instrucciones solicitaban ese nombre.

Evidencia de funcionamiento de código una vez corregidos los errores:



The image shows a Visual Studio Code editor window with three open files: `computeStatistics.py`, `convertNumbers.py`, and `wordCount.py`. The `convertNumbers.py` file is active, displaying Python code for converting decimal numbers to binary and hexadecimal. The code includes comments in Spanish and uses standard Python syntax for function definitions, loops, and string operations.

Below the code editor, the `PROBLEMS` panel is open, showing two error messages. The first message indicates a pylint error: `pylint: disable=invalid-name`. The second message is a code quality rating: `Your code has been rated at 10.00/10 (previous run: 9.75/10, +0.25)`.

The `TERMINAL` panel is also open, showing the output of a Python script. The script prompts the user to enter a filename, which is `TCL.txt`. The output displays the word frequency for each word in the file, with each word followed by its count (e.g., `achieve: 1`, `adequate: 1`, etc.).

```
1 #pylint: disable=invalid-name
2
3 Codigo para convertir numeros
4
5 import time
6 import sys
7
8 def decimal_to_binary(n):
9     """
10     Codigo para convertir de decimal a binario
11     """
12     if n == 0:
13         return "0"
14     binary = ""
15     while n > 0:
16         binary = str(n % 2) + binary
17         n //= 2
18     return binary
19
20 def decimal_to_hexadecimal(n):
21     """
22     Codigo para convertir de decimal a hexadecimal
23     """
24     if n == 0:
```

Kevin@MacBook-Pro-de-Kevin P3 % pylint wordCount.py

Your code has been rated at 10.00/10 (previous run: 9.75/10, +0.25)

Kevin@MacBook-Pro-de-Kevin P3 % python3 wordCount.py

Word Frequency:

Enter the filename: TCL.txt

achieve: 1

adequate: 1

adventures: 1

anal: 1

andrews: 1

assessed: 1

bedding: 1

blades: 1

buying: 1

cartridge: 1

cgis: 1

championship: 1

clear: 1

clubs: 1

coastal: 1

collect: 1

comm: 1

confirm: 1