Software Engineering (IT 314)
Lab: 05

ID: 202001046
Name: Meet Sutariya

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❖ Pylint

- **Details about Errors/bugs in Pylint:**

S.No	Message Object	Expansion	Explanation
1.	C	Convention	It is displayed when the program is not following the standard rules.
2.	R	Refactor	It is displayed for bad code smell
3.	W	Warning	It is displayed for python specific problems
4.	E	Error	It is displayed when that particular line execution results some error
5.	F	Fatal	It is displayed when pylint has no access to further process that line.

- ID **C0326** suggests a bad-white space error means we need to give a whitespace between **a** and **=** symbol. This rule is applicable to all declarations where an operator is used immediately after an identifier.
- ID **C0304** comes under missing-new-line suggestion which means we have to add a blank line when we complete our code.
- ID **C0114** comes under missing-module-docstring suggestion which means we need to add a docstring at the top which refers to the use of the program written below that.
- ID **C0103** comes under invalid-name suggestion which can be avoided by writing the identifiers starting with a capital letter. But, we usually believe that class names use CamelCasing i.e class names start with an upper-case letter. To avoid this suggestion we will add a regular expression to pylint that actually accepts all the variables in the lowercase letters.

1) temp.py

```python
def compute_hcf(x, y):

    if x > y:
        smaller = y
    else:
        smaller = x
    for i in range(1, smaller+1):
        if((x % i == 0) and (y % i == 0)):
            hcf = i
    return hcf


num1 = 54
num2 = 24


print("The H.C.F. is", compute_hcf(num1, num2))
```

Reference Link:

Terminal:

```
temp.py:9:19: C0303: Trailing whitespace (trailing-whitespace)
temp.py:12:9: C0303: Trailing whitespace (trailing-whitespace)
temp.py:1:0: C0114: Missing module docstring (missing-module-docstring)
temp.py:1:0: C0116: Missing function or method docstring (missing-function-docstring)
temp.py:1:16: C0103: Argument name "x" doesn't conform to snake_case naming style (invalid-name)
temp.py:1:19: C0103: Argument name "y" doesn't conform to snake_case naming style (invalid-name)
temp.py:12:0: C0103: Constant name "num1" doesn't conform to UPPER_CASE naming style (invalid-name)
temp.py:13:0: C0103: Constant name "num2" doesn't conform to UPPER_CASE naming style (invalid-name)

------------------------------------------------------------------
Your code has been rated at 2.73/10 (previous run: 2.73/10, +0.00)
```

Analysis:
- All the errors are true.

- **Error Types:**

- **Trailing Whitespace**
- **Missing Module Docstring**
- **UPPER_CASE naming style**
- **Snake_case naming style**

2) **temp2.py**

```python
num = 29

flag = False

if num == 1:
    print(num, "is not a prime number")
elif num > 1:

    for i in range(2, num):
        if (num % i) == 0:
            flag = True
            break

    if flag:
        print(num, "is not a prime number")
    else:
        print(num, "is a prime number")
```

Reference Link:

Terminal:

```
PS C:\Users\student\Desktop> py -m pylint temp2.py
************* Module temp2
temp2.py:17:0: C0304: Final newline missing (missing-final-newline)
temp2.py:1:0: C0114: Missing module docstring (missing-module-docstring)
temp2.py:1:0: C0103: Constant name "num" doesn't conform to UPPER_CASE naming style (invalid-name)
temp2.py:3:0: C0103: Constant name "flag" doesn't conform to UPPER_CASE naming style (invalid-name)
temp2.py:11:12: C0103: Constant name "flag" doesn't conform to UPPER_CASE naming style (invalid-name)


----------------------------------------------------------------
Your code has been rated at 5.83/10 (previous run: 5.83/10, +0.00)
```

Analysis:

- **All the errors are true.**

After Improvement:

```
'''
Program for check whether given Nber is prime or not
'''


N = 29


F = False


if N == 1:
    print(N, "is not a prime Nber")
elif N > 1:


    for i in range(2, N):
        if (N % i) == 0:
            F = True
            break


    if F:
```

```
        print(N, "is not a prime Nber")
    else:
        print(N, "is a prime Nber")
```

Terminal:

```
PS C:\Users\student\Desktop> py -m pylint temp2.py

-------------------------------------------------------------------
Your code has been rated at 10.00/10 (previous run: 10.00/10, +0.00)

PS C:\Users\student\Desktop> █
```

3) Pylint:

```python
import torch
import torch.nn as nn

import argparse

from transformers import GPTNeoXForCausalLM

from transformers import AutoConfig, AutoTokenizer

from transformers.modeling_utils import no_init_weights
import os


def create_empty_gptneox(config):

    import torch
    import torch.nn as nn

    _reset_parameters_linear = nn.Linear.reset_parameters
    def dummy(*args, **kargs):
        pass
    nn.Linear.reset_parameters = dummy
```

Reference Link:

Terminal:

```
************* Module temp
temp.py:43:0: C0301: Line too long (119/100) (line-too-long)
temp.py:51:0: C0301: Line too long (102/100) (line-too-long)
temp.py:64:0: C0301: Line too long (102/100) (line-too-long)
temp.py:82:0: C0301: Line too long (102/100) (line-too-long)
temp.py:89:0: C0303: Trailing whitespace (trailing-whitespace)
temp.py:91:62: C0303: Trailing whitespace (trailing-whitespace)
temp.py:93:62: C0303: Trailing whitespace (trailing-whitespace)
temp.py:95:58: C0303: Trailing whitespace (trailing-whitespace)
temp.py:97:67: C0303: Trailing whitespace (trailing-whitespace)
temp.py:100:0: C0303: Trailing whitespace (trailing-whitespace)
temp.py:103:0: C0303: Trailing whitespace (trailing-whitespace)
temp.py:113:0: C0303: Trailing whitespace (trailing-whitespace)
temp.py:116:0: C0304: Final newline missing (missing-final-newline)
temp.py:1:0: C0114: Missing module docstring (missing-module-docstring)
temp.py:1:0: E0401: Unable to import 'torch' (import-error)
temp.py:2:0: R0402: Use 'from torch import nn' instead (consider-using-from-import)
temp.py:2:0: E0401: Unable to import 'torch.nn' (import-error)
temp.py:6:0: E0401: Unable to import 'transformers' (import-error)
temp.py:8:0: E0401: Unable to import 'transformers' (import-error)
temp.py:10:0: E0401: Unable to import 'transformers.modeling_utils' (import-error)
temp.py:14:0: C0116: Missing function or method docstring (missing-function-docstring)
temp.py:14:25: W0621: Redefining name 'config' from outer scope (line 107) (redefined-outer-name)
temp.py:16:4: W0621: Redefining name 'torch' from outer scope (line 1) (redefined-outer-name)
temp.py:17:4: W0621: Redefining name 'nn' from outer scope (line 2) (redefined-outer-name)
```

- **Error Types:**

  - **C0301: Line-too-long**
  - **C0303: Trailing whitespace**
  - **C0114: Missing module docstring**
  - **E0401: Import-error**
  - **W0621: redefined-outer-name**
  - **W0611: unused-import**
  - **C0411: wrong-import-order**
  - **C0116: missing-function-docstring**

❖ Flake8

1) temp2.py

```python
def prime(num):
    if num == 1:
        print(num, "is not a prime number")
    elif num >1:
        for i in range(2, num):
            if (num % i) == 0:
                flag =True
                break
        if flag:
            print(num,"is not a prime number")
        else:
            print(num,"is a prime number")


prime(35)
```

Terminal:

```
PS C:\Users\student\Desktop> py -m flake8 temp2.py
temp2.py:4:15: E225 missing whitespace around operator
temp2.py:7:23: E225 missing whitespace around operator
temp2.py:10:22: E231 missing whitespace after ','
temp2.py:12:22: E231 missing whitespace after ','
temp2.py:14:1: E305 expected 2 blank lines after class or function definition, found 1
temp2.py:14:10: W292 no newline at end of file
PS C:\Users\student\Desktop> []
```

Analysis:
- All the errors are true.

After Improvement:

```python
'''
function for check whether given number is prime or not
'''


def prime(num):

    if num == 1:
        print(num, "is not a prime number")
    elif num > 1:
        for i in range(2, num):
            if (num % i) == 0:
                flag = True
                break
        if flag:
            print(num, "is not a prime number")
        else:
            print(num, "is a prime number")


prime(35)
```

Terminal:

```
PS C:\Users\student\Desktop> py -m flake8 temp2.py
PS C:\Users\student\Desktop> []
```

2)

```python
import torch
import torch.nn as nn

import argparse

from transformers import GPTNeoXForCausalLM

from transformers import AutoConfig, AutoTokenizer

from transformers.modeling_utils import no_init_weights
import os


def create_empty_gptneox(config):

    import torch
    import torch.nn as nn

    _reset_parameters_linear = nn.Linear.reset_parameters
    def dummy(*args, **kargs):
        pass
    nn.Linear.reset_parameters = dummy
```

Reference Link:

Terminal:

```
temp.py:33:80: E501 line too long (92 > 79 characters)
temp.py:43:80: E501 line too long (119 > 79 characters)
temp.py:46:37: E231 missing whitespace after ':'
temp.py:46:45: E231 missing whitespace after ','
temp.py:46:80: E501 line too long (92 > 79 characters)
temp.py:46:86: F541 f-string is missing placeholders
temp.py:51:43: E231 missing whitespace after ':'
temp.py:51:51: E231 missing whitespace after ','
temp.py:51:80: E501 line too long (102 > 79 characters)
temp.py:54:80: E501 line too long (80 > 79 characters)
temp.py:61:41: E231 missing whitespace after ':'
temp.py:61:49: E231 missing whitespace after ','
temp.py:61:80: E501 line too long (98 > 79 characters)
temp.py:64:80: E501 line too long (102 > 79 characters)
temp.py:65:80: E501 line too long (84 > 79 characters)
temp.py:67:37: E231 missing whitespace after ':'
temp.py:67:45: E231 missing whitespace after ','
temp.py:67:80: E501 line too long (94 > 79 characters)
temp.py:70:80: E501 line too long (80 > 79 characters)
temp.py:71:80: E501 line too long (92 > 79 characters)
temp.py:72:80: E501 line too long (88 > 79 characters)
temp.py:79:41: E231 missing whitespace after ':'
temp.py:79:49: E231 missing whitespace after ','
temp.py:79:80: E501 line too long (98 > 79 characters)
```

- **Error Types:**

- **F401: imported but unused**
- **E231: missing whitespace**
- **E501: line too long**
- **W291: trailing whitespace**
- **W293: blank line contains whitespace**
- **W292: no newline at end of file**