Hands-on Lab: Static Code Analysis

Skills Network

Estimated time needed: **30** minutes

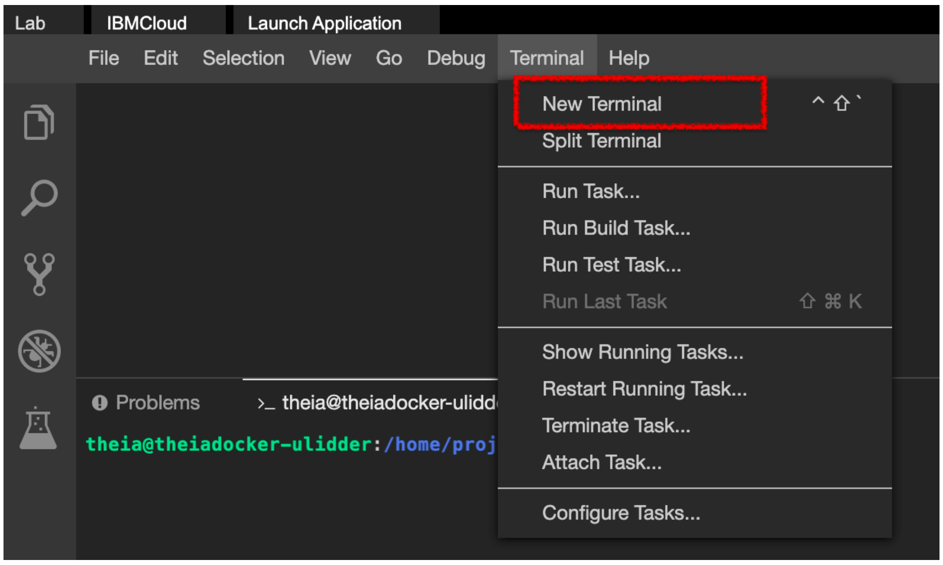
Objectives

After completing this lab you will be able to:

- Install pylint package
- Run Static Code Analysis on a python program
- Check the compliance score of a python program.
- Fix common mistakes and improve the compliance score.

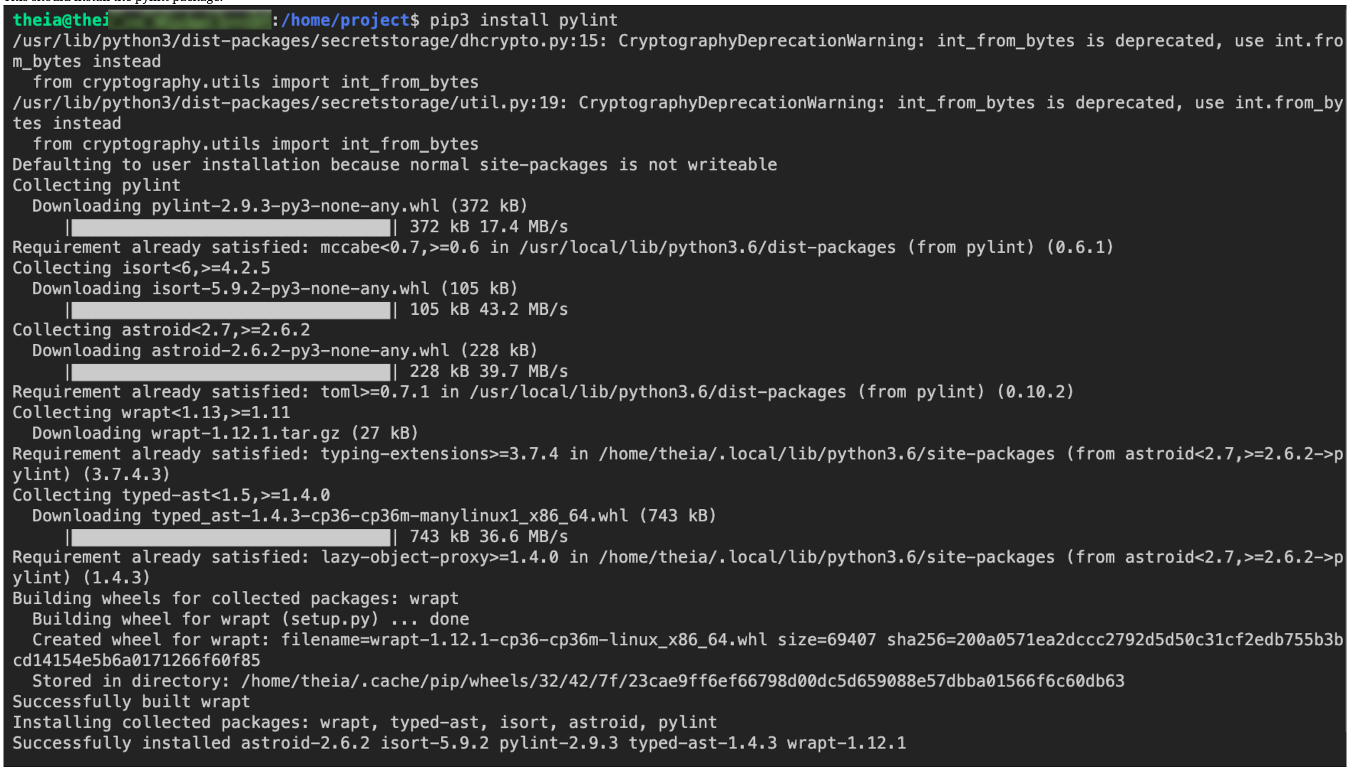
Install the pylint package

1. Open a new terminal.



```
pip3 install pylint==2.11.1
```

3. This should install the pylint package.



```
theia@thei[redacted]:/home/project$ pip3 install pylint
/usr/lib/python3/dist-packages/secretstorage/dhcrypto.py:15: CryptographyDeprecationWarning: int_from_bytes is deprecated, use int.fro
m_bytes instead
  from cryptography.utils import int_from_bytes
/usr/lib/python3/dist-packages/secretstorage/util.py:19: CryptographyDeprecationWarning: int_from_bytes is deprecated, use int.from_by
tes instead
  from cryptography.utils import int_from_bytes
Defaulting to user installation because normal site-packages is not writeable
Collecting pylint
  Downloading pylint-2.9.3-py3-none-any.whl (372 kB)
     |████████████████████████████████| 372 kB 17.4 MB/s
Requirement already satisfied: mccabe<0.7,>=0.6 in /usr/local/lib/python3.6/dist-packages (from pylint) (0.6.1)
Collecting isort<6,>=4.2.5
  Downloading isort-5.9.2-py3-none-any.whl (105 kB)
     |████████████████████████████████| 105 kB 43.2 MB/s
Collecting astroid<2.7,>=2.6.2
  Downloading astroid-2.6.2-py3-none-any.whl (228 kB)
     |████████████████████████████████| 228 kB 39.7 MB/s
Requirement already satisfied: toml>=0.7.1 in /usr/local/lib/python3.6/dist-packages (from pylint) (0.10.2)
Collecting wrapt<1.13,>=1.11
  Downloading wrapt-1.12.1.tar.gz (27 kB)
Requirement already satisfied: typing-extensions>=3.7.4 in /home/theia/.local/lib/python3.6/site-packages (from astroid<2.7,>=2.6.2->p
ylint) (3.7.4.3)
Collecting typed-ast<1.5,>=1.4.0
  Downloading typed_ast-1.4.3-cp36-cp36m-manylinux1_x86_64.whl (743 kB)
     |████████████████████████████████| 743 kB 36.6 MB/s
Requirement already satisfied: lazy-object-proxy>=1.4.0 in /home/theia/.local/lib/python3.6/site-packages (from astroid<2.7,>=2.6.2->p
ylint) (1.4.3)
Building wheels for collected packages: wrapt
  Building wheel for wrapt (setup.py) ... done
  Created wheel for wrapt: filename=wrapt-1.12.1-cp36-cp36m-linux_x86_64.whl size=69407 sha256=200a0571ea2dccc2792d5d50c31cf2edb755b3b
cd14154e5b6a0171266f60f85
  Stored in directory: /home/theia/.cache/pip/wheels/32/42/7f/23cae9ff6ef66798d00dc5d659088e57dbba01566f6c60db63
Successfully built wrapt
Installing collected packages: wrapt, typed-ast, isort, astroid, pylint
Successfully installed astroid-2.6.2 isort-5.9.2 pylint-2.9.3 typed-ast-1.4.3 wrapt-1.12.1
```

Create a sample python file for static code analysis

Create a new file named **sample1.py**

Copy and paste the below code into **sample1.py**

```
# Define a function named 'add' that takes two arguments, 'number1' and 'number2'.
def add(number1, number2):
    # The function returns the sum of 'number1' and 'number2'.
    return number1 + number2
# Initialize the variable 'num1' with the value 4.
num1 = 4
# Initialize the variable 'num2' with the value 5.
num2 = 5
# Call the 'add' function with 'num1' and 'num2' as arguments and store the result in 'total'.
total = add(num1, num2)
# Print the result of adding 'num1' and 'num2' using the 'format' method to insert the values into the string.
print("The sum of {} and {} is {}".format(num1, num2, total))
```

Save the file **sample1.py**

Run pylint

- Open a terminal
- Run the below command

```
pylint sample1.py
```

- Pylint goes through every line of code and gives you a list all the non-compliant lines.
- Pylint gives you a compliance score (10 being maximum).

Correct the mistakes identified by pylint.

- Based on the report given by pylint changes were made to this code to address the following issues.
  - Exactly one space required after comma
  - Exactly one space required around assignment
- Create a new file named **sample2.py**
- Copy and paste the below code into **sample2.py**

```
# Define a function named 'add' that takes two arguments, 'number1' and 'number2'.
# The purpose of this function is to add the two numbers and return the result.
def add(number1, number2):
    # Return the sum of 'number1' and 'number2'.
    # This line computes the addition of the two input numbers and outputs the result.
    return number1 + number2
# Initialize the constant variable 'NUM1' with the value 4.
# Constants are usually written in uppercase letters to indicate that they should not be changed.
NUM1 = 4
# Initialize the variable 'num2' with the value 5.
# This variable will be used as the second input to the 'add' function.
num2 = 5
# Call the 'add' function with 'NUM1' and 'num2' as arguments.
# The result of this addition operation is stored in the variable 'total'.
total = add(NUM1, num2)
# Print a formatted string that displays the sum of 'NUM1' and 'num2'.
# The 'format' method is used to insert the values of 'NUM1', 'num2', and 'total' into the string.
print("The sum of {} and {} is {}".format(NUM1, num2, total))
```

Save the file **sample2.py**

Run pylint

- Open a terminal
- Run the below command

```
pylint sample2.py
```

- This will give you the compliance score.
- This time you should see the score improve.

Your task

Improve the score in sample2.py to a perfect 10 by correcting all the issues pointed out by pylint. If cant figure out how to solve some issues it is helpful to google the pylint message.

Congratulations!

You now know how to perform static code analysis.

Author(s)

Ramesh Sannareddy

Other Contributors

Rav Ahuja