

Hands-on Lab: Creating a Python Package



Creating a Python Package

Estimated time needed: **30** minutes

Objectives

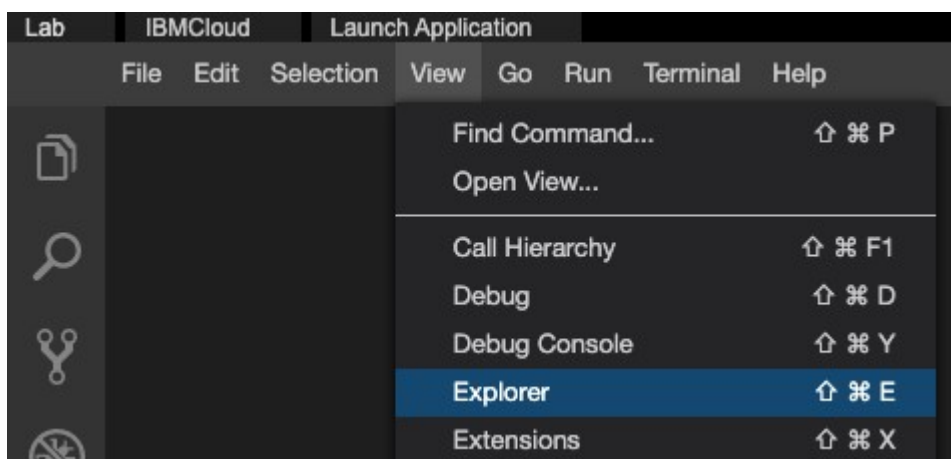
In this lab you will :

- Create a module named basic
- Add two functions to the module basic
- Create a module named stats
- Add two functions to the module stats
- Create a python package named mymath
- Verify that the package is working

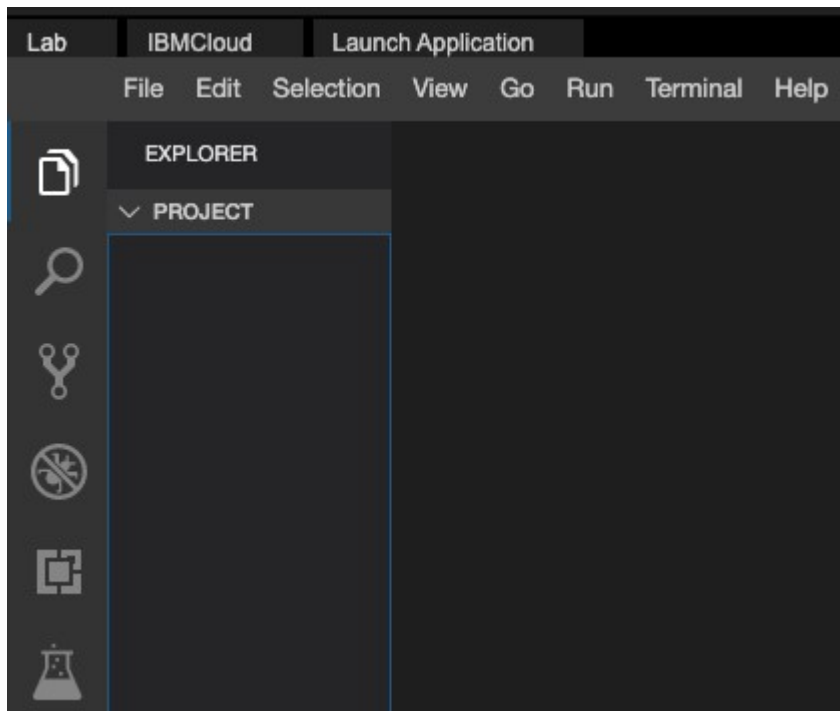
Lab

Create Package

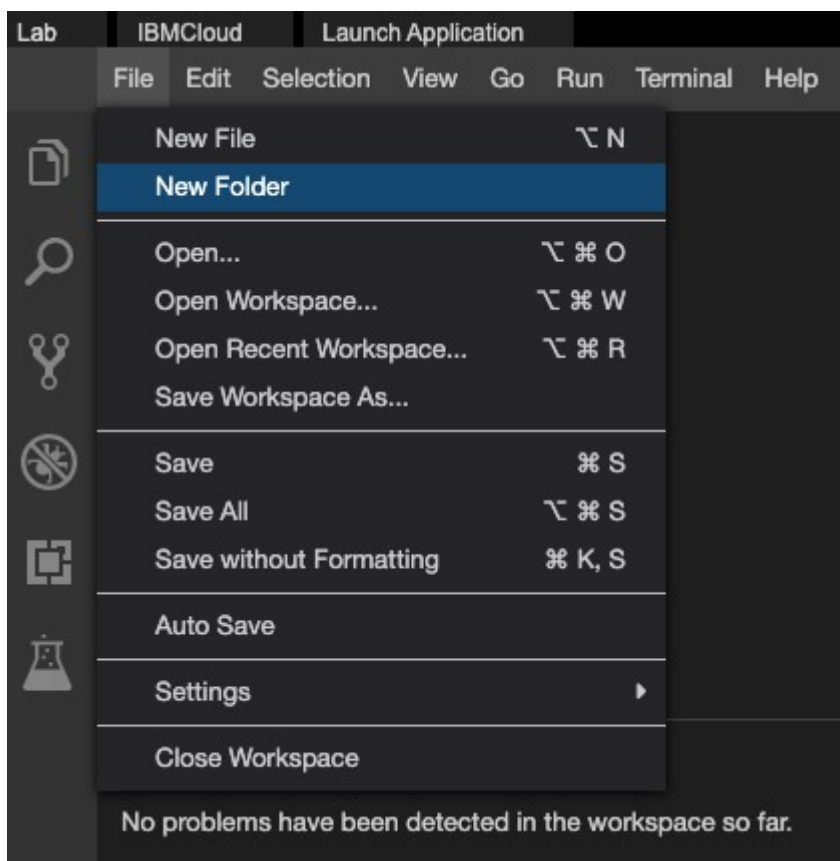
- On the window to the right, click on the **View** menu and select **Explorer** option, as shown in the image below.



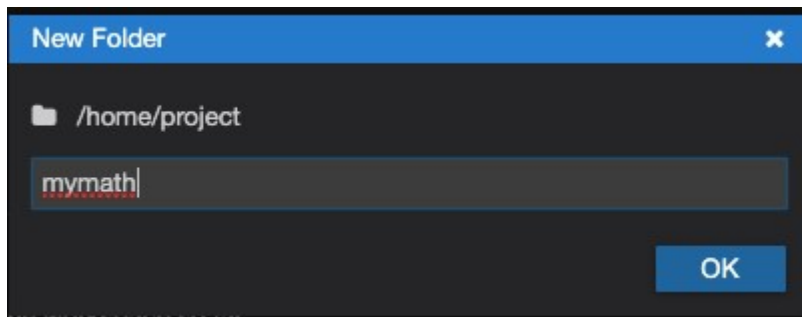
- Your IDE now should look like the image below.



- On the window to the right, click on the **File** menu and select **New Folder** option, as shown in the image below.



- Enter **mymath** and click OK as shown in the image below.



Create the first module

- Create a python module named basic

Create a file named **basic.py**.

Copy and paste the below code into basic.py

```
1. 1
2. 2
3. 3
4. 4
5. 5
6. 6
7. 7
8. 8
9. 9
10. 10
11. 11
12. 12
13. 13
14. 14
15. 15
16. 16
17. 17

1. def square(number):
2.     """
3.     This function returns the square of a given number
4.     """
5.     return number ** 2
6.
7. def double(number):
8.     """
9.     This function returns twice the value of a given number
10.    """
11.    return number * 2
12.
13. def add(a, b):
14.     """
15.     This function returns the sum of given numbers
16.     """
17.     return a + b
```

Copied!

You should see a screen like this now.

basic.py ●

```
1  def square(number):
2      """
3      This function returns the square
4      """
5      return number ** 2
6
7
8  def double(number):
9      """
10     This function returns twice the
11     """
12     return number * 2
13
14  def add(a, b):
15      """
16     This function returns the sum of
17     """
18     return a + b
19
```

Save the file **basic.py**

Create the second module

- Create a module named stats

Create a file named **stats.py**.

Copy and paste the below code into stats.py

```
1. 1
2. 2
3. 3
4. 4
5. 5
6. 6
7. 7
8. 8
9. 9
10. 10
11. 11
12. 12
13. 13
14. 14
15. 15
16. 16
17. 17
18. 18
19. 19

1. def mean(numbers):
2.     """
3.     This function returns the mean of the given list of numbers
4.     """
5.     return sum(numbers)/len(numbers)
6.
7. def median(numbers):
8.     """
9.     This function returns median of the given list of numbers
10.    """
11.    numbers.sort()
12.
13.    if len(numbers) % 2 == 0:
14.        median1 = numbers[len(numbers) // 2]
15.        median2 = numbers[len(numbers) // 2 - 1]
16.        mymedian = (median1 + median2) / 2
17.    else:
18.        mymedian = numbers[len(numbers) // 2]
19.    return mymedian
```

Copied!

You should see a screen like this now.

stats.py ●

```
1  def mean(numbers):
2      """
3      This function returns the mean
4      """
5      return sum(numbers)/len(numbers)
6
7
8  def median(numbers):
9      """
10     This function returns median of
11     """
12     numbers.sort()
13
14     if len(numbers) % 2 == 0:
15         median1 = numbers[len(numbers)//2-1]
16         median2 = numbers[len(numbers)//2]
17         mymedian = (median1 + median2)/2
18     else:
19         mymedian = numbers[len(numbers)//2]
20     return mymedian
```

Save the file **stats.py**

Create init.py

- Create the file `__init__.py`

Copy and paste the below code into `__init__.py`

- 1.
 - 2.
-
1. `from . import basic`
 2. `from . import stats`

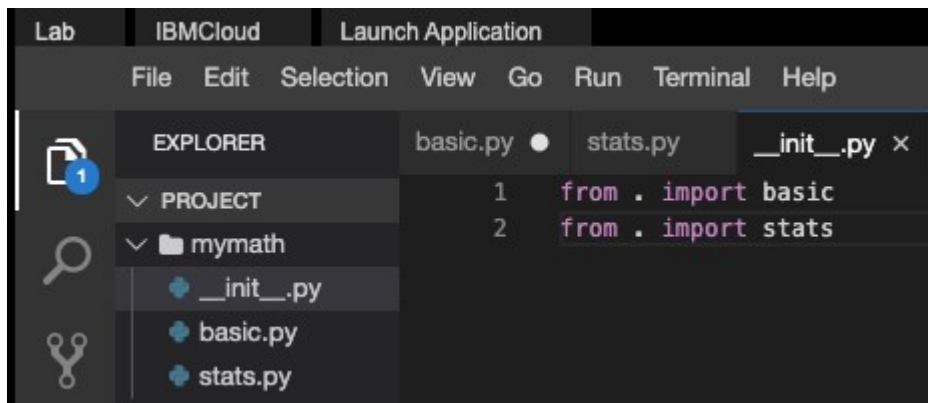
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Save the file `__init__.py`

Now your directory structure should look like

- 1.
 - 2.
 - 3.
 - 4.
-
1. `mymath`
 2. `mymath/__init__.py`
 3. `mymath/basic.py`
 4. `mymath/statistics.py`

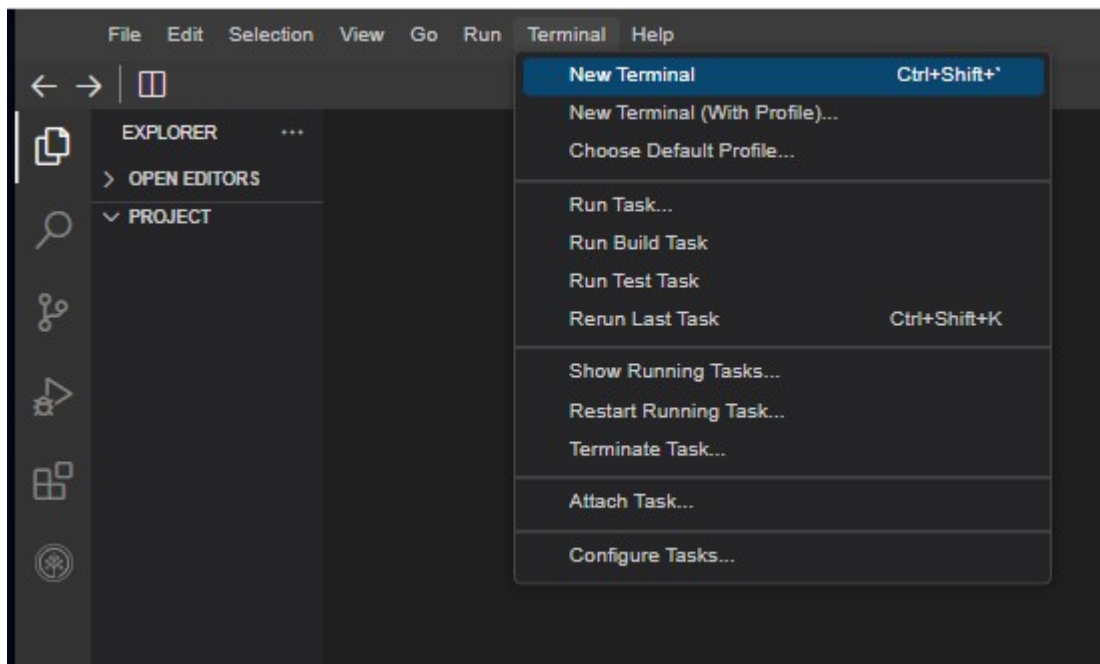
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You are done creating a package

Verify the package

- On the window to the right, click on the **Terminal** menu and select **New Terminal** option, as shown in the image below.



- You will see a terminal open up on the bottom of the screen like the one in the image below.

```
theia@theiadocker-rsannareddy: /home/project x
theia@theiadocker-rsannareddy: /home/project$ █
```

- At the terminal type **python3** to invoke python interpreter.
- Once the python interpreter is loaded.
- At the python prompt type **import mymath**
- If the above command runs without errors, it is an indication that the mymath package is successfully loaded.
- At the python prompt type **mymath.basic.add(3,4)**
- You should see an output 7 on the screen.
- At the python prompt type **mymath.stats.mean([3,4,5])**
- You should see an output 4.0 on the screen.
- Type **exit()** to quit python interpreter.

```
theia@theiadocker-rsannareddy: /home/project x
theia@theiadocker-rsannareddy: /home/project$ python3
Python 3.6.9 (default, Oct 8 2020, 12:12:24)
[GCC 8.4.0] on linux
Type "help", "copyright", "credits" or "license" for more information.
>>> import mymath
>>> mymath.basic.add(3,4)
7
>>> mymath.stats.mean([3,4,5])
4.0
>>> exit()
theia@theiadocker-rsannareddy: /home/project$ █
```

Practice Exercise

Create a new module named geometry and add to the mymath package.

- Create a module name geometry
- Add a function named `area_of_rectangle` that takes length and breadth as input and returns the area of a rectangle.
- Add a function named `area_of_circle` that takes radius as input and returns the area of a circle.
- Modify the `__init__.py` to include this module.
- Import and test the function `area_of_circle` from python terminal.

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