

Laboratory Objectives

1. Write a Python program using:
 - i. modules
 - ii. packages
 - iii. functions using keyword arguments
2. Run and test a Python program.

Program Instructions

1. Write a Python package with sub-packages, modules, and functions using keyword arguments. Use the following directory outline and module names (your first starting point should be a directory called `mathematics` within an empty directory

```
mathematics/  
  __init__.py  
  whoami.py  
  numbers/  
    __init__.py  
    whoami.py  
    series.py  
    simple.py  
  geometry/  
    __init__.py  
    whoami.py  
    rectangle.py  
    circle.py  
    cube.py
```

2. Create a `mathematics` package.
 - i. Initialize the `__all__` variable to the `whoami` module.
 - ii. Create a `whoami` module.
 - a. Create a function named `getname` which returns the `__name__` variable.
 - iii. Create a `numbers` sub-package:
 - a. Initialize the `__all__` variable so that the `whoami` and `series` modules (and not the `simple` module) can be imported when `'from mathematics.numbers import *'` is encountered.
 - b. Create a `whoami` module.
 - a. Create a function named `getname` which returns the `__name__` variable.
 - c. Create a `series` module:

- a. Create a function named `sum` which receives a keyword parameter list and returns the sum of all the values in the list.
 - b. Create a function named `average` which receives a keyword parameter list and returns the average of all the values in the list.
 - d. Create a simple module:
 - a. Create a function named `addition` which receives the keyword parameters `left` and `right` and returns `left plus right`.
 - b. Create a function named `subtraction` which receives the keyword parameters `left` and `right` and returns `left minus right`.
 - c. Create a function named `multiplication` which receives the keyword parameters `left` and `right` and returns `left multiplied by right`.
 - d. Create a function named `division` which receives the keyword parameters `left` and `right` and returns `left divided by right`.
- iv. Create a geometry sub-package.
 - a. Initialize the `__all__` variable so that the `whoami`, `circle`, and `cube` modules (and not the `rectangle` module) can be imported when `'from mathematics.geometry import *'` is encountered.
 - b. Create a `whoami` module:
 - a. Create a function named `getname` which returns the `__name__` variable.
 - c. Create a `rectangle` module:
 - a. Create a function named `perimeter` which receives a keyword parameters `length` and `width` and returns `(2l + 2w)`.
 - b. Create a function named `area` which receives a keyword parameters `length` and `width` and returns `(l * w)`.
 - d. Create a `circle` module:
 - a. Create a function named `circumference` which receives the keyword parameter `radius` and returns `(2 * pi * r)`.
 - b. Create a function named `area` which receives the keyword parameter `radius` and returns `(pi * r * r)`.
 - e. Create a `cube` module.
 - a. Create a function named `surface_area` which receives the keyword parameter `side` and returns `(s * s * 6)`.
 - b. Create a function named `volume` which receives the keyword parameter `side` and returns `(s * s * s)`.
- 3. Create your own `main.py` file to import and test all the modules and functions until you are satisfied your program output meets the above requirements. I will not grade this file - it is for your use to test the package.

Submission

Zip the directory structure (and all its files) shown in step 1 of the instruction above and upload the zip file to Canvas