Dynamic loading modules

Python provides a predefined module called “importlib”.
This module provides the following functions to achieve dynamic loading of modules. This library is used by import statement for importing modules.

importlib.**import_module**(name)

Example:

```
import importlib

m5=importlib.import_module("module5")
print(m5)
print(m5.add())
print(m5.sub())
```

Output

```
<module 'module5' from 'C:\\Users\\nit\\PycharmProjects\\
pythonProject10\\module5.py'>
300
-100
```

Example:

```
# Write a program to import any module
import importlib
module_name=input("Enter ModuleName ")
m=importlib.import_module(module_name)
print(m)
```

Output

```
Enter ModuleName module5
<module 'module5' from 'C:\\Users\\nit\\PycharmProjects\\
pythonProject10\\module5.py'>
```

Example:

```
# Write a program to find sqrt of a number
import importlib
num=int(input("Enter any number "))
```

```
if num>=0:
    m=importlib.import_module("math")
    print(m.sqrt(num))
else:
    m = importlib.import_module("cmath")
    print(m.sqrt(num))
```

Output

```
Enter any number 9
3.0
```

importlib.reload(*module*)

Reload a previously imported *module*. The argument must be a module object, so it must have been successfully imported before. This is useful if you have edited the module source file using an external editor and want to try out the new version without leaving the Python interpreter. The return value is the module object

```
# Write a program to find sqrt of a number

import importlib

m=importlib.import_module("module5")
m=importlib.reload(m)
print(m.add())
print(m.sub())
```

Packages

What is package?

Package is a collection of modules.
Package is a collection of python programs/files.
Package is a folder/directory which contains .py files.
The folder which contains a special module **__init__.py** is called package.

Advantage of packages

1. Modularity : Grouping set of related modules within one container (package)
2. Reusability: The content of one package can be used by one or more than module/program.
3. Maintaining code is easy
4. Hiding modules within package

Packages are two types

1. **Predefined packages**
2. **User defined packages**

The existing packages are called predefined packages (OR) packages provided by python or third party vendor.

Example: numpy, pandas, matplotlib,...

The packages created by programmer are called user defined packages. These are application specific packages.

What is __init__.py?

__init__.py is a called package configuration file/module.
This module is used for creating,

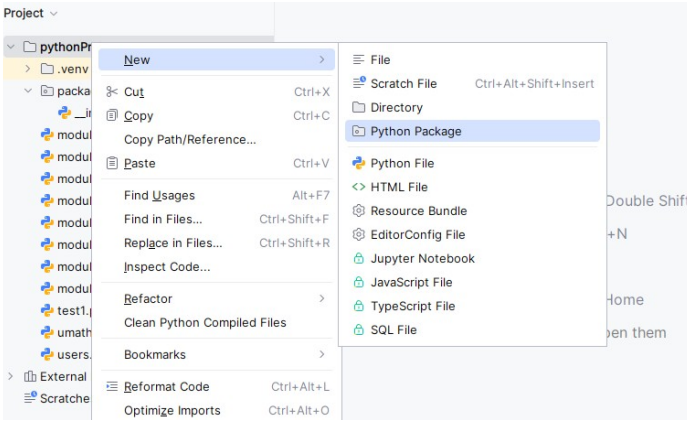
1. Package level variables
2. Package level functions
3. Package level classes
4. Importing modules at package level

This module is magic module and it is executed automatically when package is imported.

How to create package?

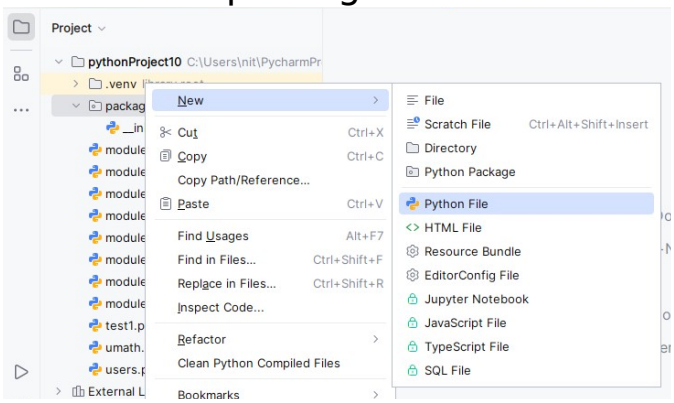
Creating package in pycharm

1. Select project



How to add module within package?

1. Select package



How to import module outside the package?

`import package1.m1`
 	
`package1.m1.fun1()`
	`from package1 import m1`
	
	`m1.fun1()`

`package1.m1.fun2()` `package1.m1.fun3()`	`m1.fun2()` `m1.fun3()`

```
from package1.m1 import *

fun1()
fun2()
fun3()
```

How import modules at package level?