Modules and Packages in Python

Tushar B. Kute,
http://tusharkute.com

Lets see the example...

- Modules are used to categorize code in Python into smaller part.
- A module is simply a file, where classes, functions and variables are defined.
- Grouping similar code into a single file makes it easy to access.
- Types:
  - System modules
  - User defined modules

Advantages

- Python provides the following advantages for using module:
  - **1) Reusability:** Module can be used in some other python code. Hence it provides the facility of code reusability.
  - **2) Categorization:** Similar type of attributes can be placed in one module.

Using system modules

- import keyword
- import as
- from import

The import statement

```
>>> import math
>>> print math.sin(67)
-0.855519978975
>>> print math.log(67)
4.20469261939
>>> print math.sqrt(67)
8.18535277187
>>> print math.pi
3.14159265359
>>> print math.e
2.71828182846
```

Import using alias

```
>>> import math as m
>>> print m.sin(90)
0.893996663601
>>> print m.log(90)
4.49980967033
>>> print m.sqrt(90)
9.48683298051
>>> print m.pi
3.14159265359
>>> print m.e
2.71828182846
```

Selective import

- from..import statement is used to import particular attribute from a module.
- In case you do not want whole of the module to be imported then you can use from ?import statement.

Example:

```
>>> from math import sin, log, pi
>>> print sin(55)
-0.999755173359
>>> print log(55)
4.00733318523
>>> print pi
3.14159265359
>>> from math import *
>>> print cos(55)
0.022126756262
>>> print e
2.71828182846
```

User defined modules

- Any program stored in current working directory can be imported by import statement.
- When such program (module) is imported, we can use all functions, classes and global variables from that program in your program.
- The import, import...as and from...import will work in the same fashion..
- It creates a python compiled file with extension .pyc in current working directory

Example:

fact.py

```
def factorial(n):
    if n <= 1:
        return 1
    else:
        return n * factorial(n-1)

def hello(s):
    print "Hello", s

name = "MITU Skillologies"
```

main_prog.py

```
import fact
print fact.factorial(5)
print hello('Tushar')
print name
```

Python Package

- A Package is simply a collection of similar modules, sub-packages etc..
- Steps to create and import Package:
  - 1) Create a directory, say Info
  - 2) Place different modules inside the directory. We are placing 3 modules **`msg1.py, msg2.py`** and **`msg3.py`** respectively and place corresponding codes in respective modules. Let us place msg1() in msg1.py, msg2() in msg2.py and msg3() in msg3.py.
  - 3) Create a file **`__init__.py`** which specifies attributes in each module.
  - 4) Import the package and use the attributes using package.

Example:

msg1.py

```
def show():
    print "Module-1"
```

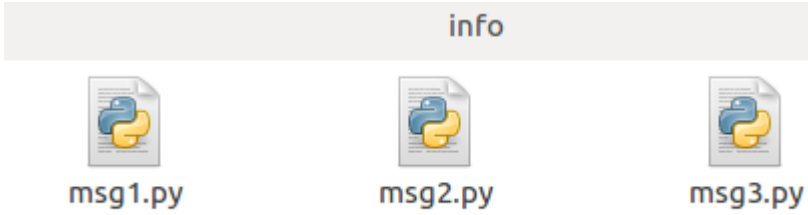
msg2.py

```
def display():
    print "Module-2"
```

msg3.py

```
def output():
    print "Module-3"
```

files

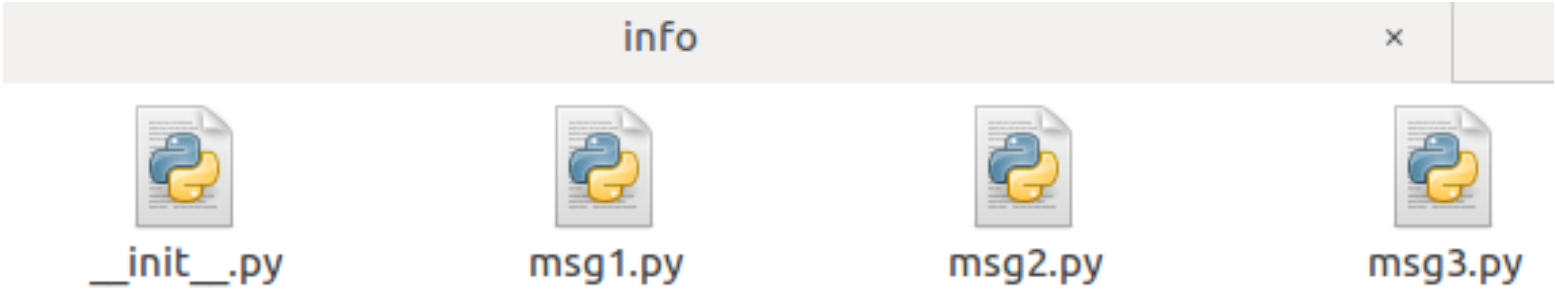


folder

__init__.py

__init__.py

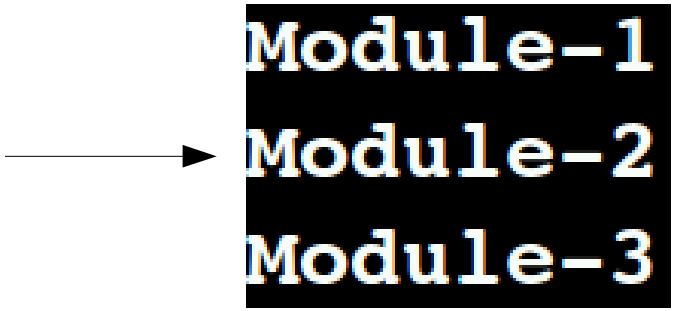
```
from msg1 import show
from msg2 import display
from msg3 import output
```



Using packages

- Now create a new file outside of ‘info’ to import the given package. We can apply all import methods to use the package.

```
import info
info.show()
info.display()
info.output()
```



- It creates four new .pyc files in info folder.

Thank you

This presentation is created using LibreOffice Impress 5.1.6.2, can be used freely as per GNU General Public License

@mitu_skillologies

/mITuSkillologies

@mitu_group

/company/mitu-skillologies

Web Resources
http://mitu.co.in
http://tusharkute.com

contact@mitu.co.in

tushar@tusharkute.com