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GNBF5010-Assigment 4

Question:

Write a python program to print Fibonacci sequence. The length of output sequence is specified by the first command line parameter in python package

Answer:

Firstly we write the python code by different algorithms for Fibonacci sequence creation and separate in different function as in Fib.py. Example, Simple Iteration algorithm with command argument as si, Simple Recursive algorithm with command argument as sr.

Fib.py

```
#--------------------------------------------------------------------
def SimpleIteration(n):
 a,b = 1,1
 print a
 for i in range(n-1):
  a,b = b,a+b
  print a
 return a


#--------------------------------------------------------------------
def SimpleRecursive(n):
 if n==1 or n==2:
  return 1
 return SimpleRecursive(n-1)+SimpleRecursive(n-2)


#--------------------------------------------------------------------
def memoize(obj):
    cache = {}

    def memoizer(*args, **kwargs):
        if args not in cache:
            cache[args] = obj(*args, **kwargs)
        return cache[args]
    return memoizer

@memoize
def MemorizedRecursive(n):
    if n < 2:
        return n
    else:
        return MemorizedRecursive(n-1) + MemorizedRecursive(n-2)

#--------------------------------------------------------------------
```

Then we prepare the file for python package which include __init__.py and setup.py files

__init__.py

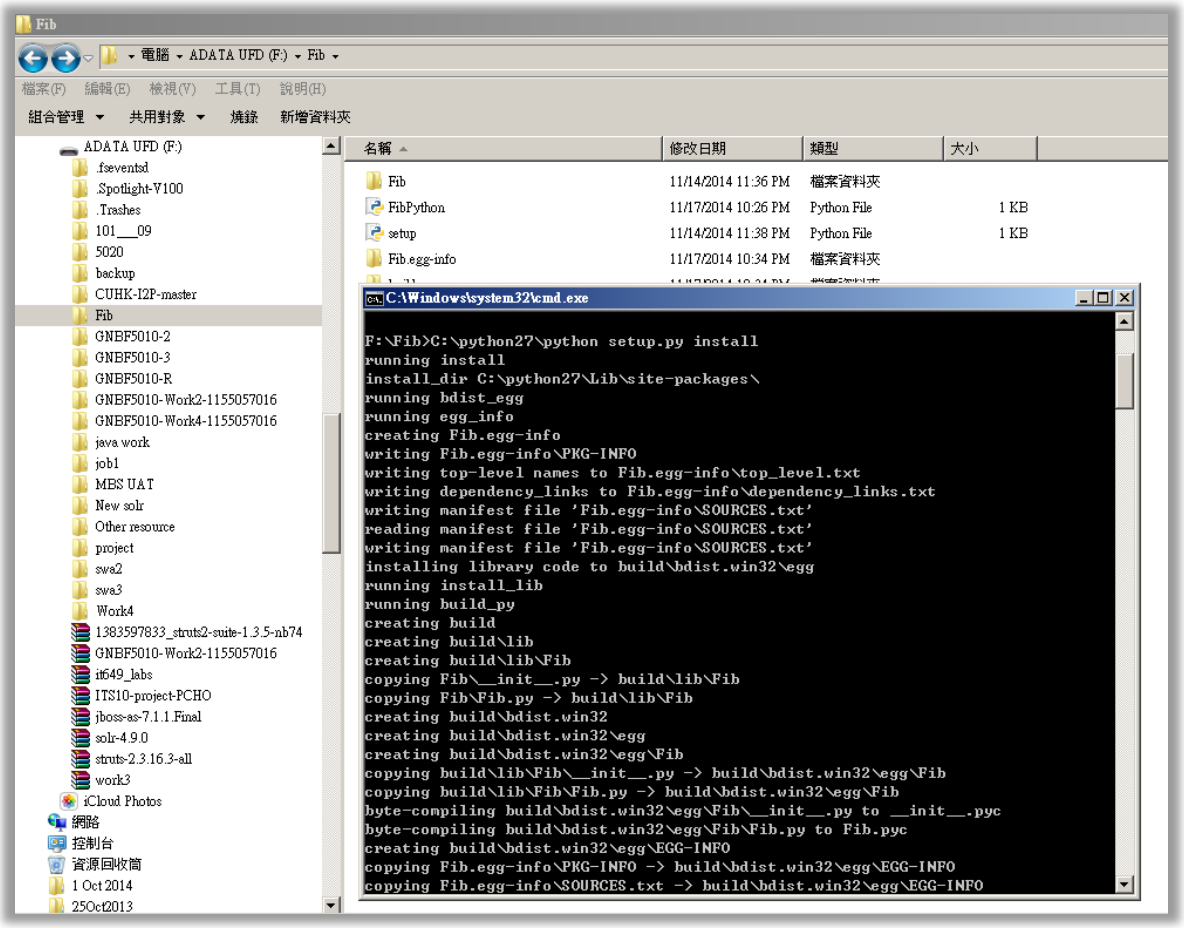
```
from .Fib import *

def init():
    return("Fib package is ready")
```

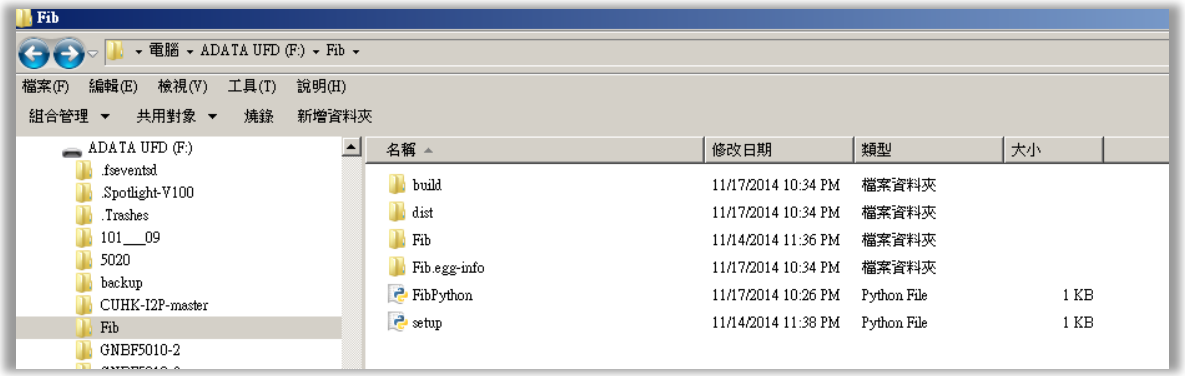
setup.py

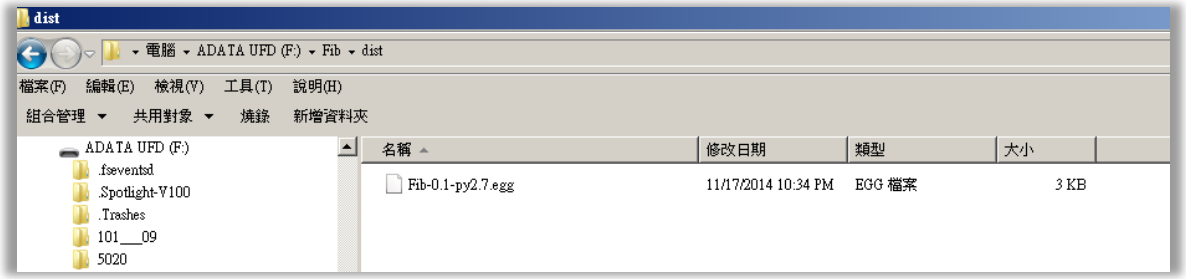
```
1  from setuptools import setup
2
3  setup(name='Fib',
4        version='0.1',
5        description='Fib package',
6        url='https://github.com/qanqchen/CUHK-I2P',
7        author='PC HO 1155057016',
8        author_email='pcho1967@gmail.com',
9        license='GPLv3',
10       packages=['Fib'],
11       zip_safe=False)
12
```

In command prompt, we change directory to the Fib folder and run setuptools to create the python package or the python egg.



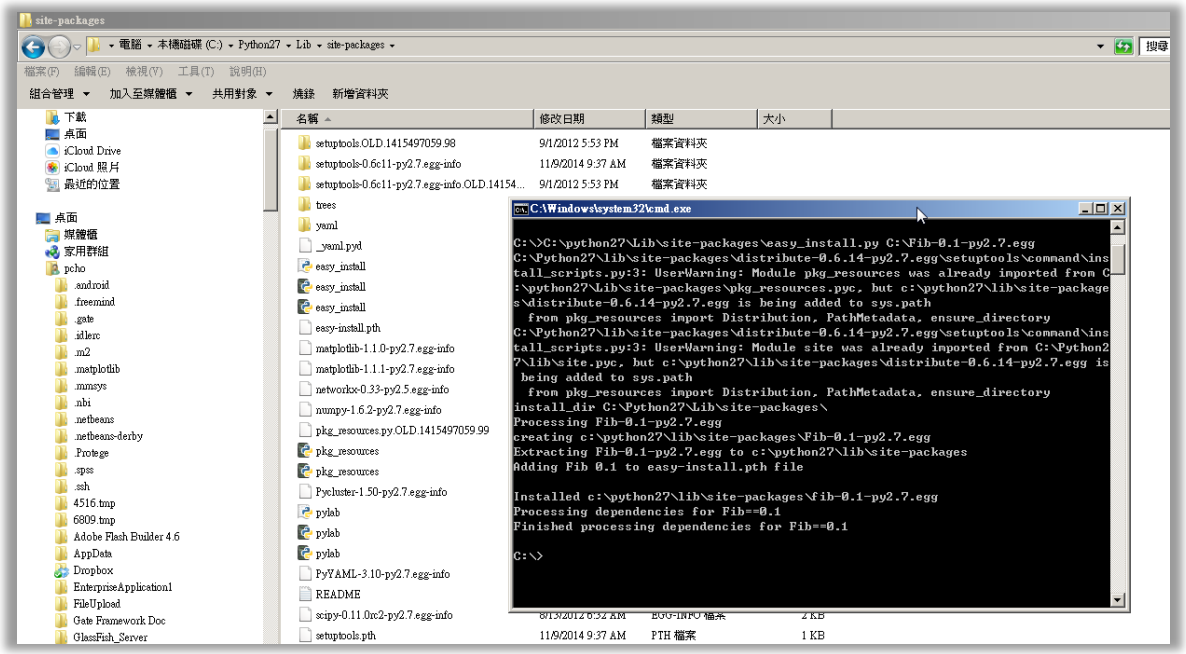
It will create python egg with additional files such as dist, build, Fib.egg-info folder where dist folder contain the python package of Fib in a file name as Fib-0.1-py2.7.egg.





The file use our package name as prefix then version number declare in the setup.py, python version to generate the python byte code with a file name extension as .egg. It is the python package which ready for distribute and install on any PC by easy setup or PIP.

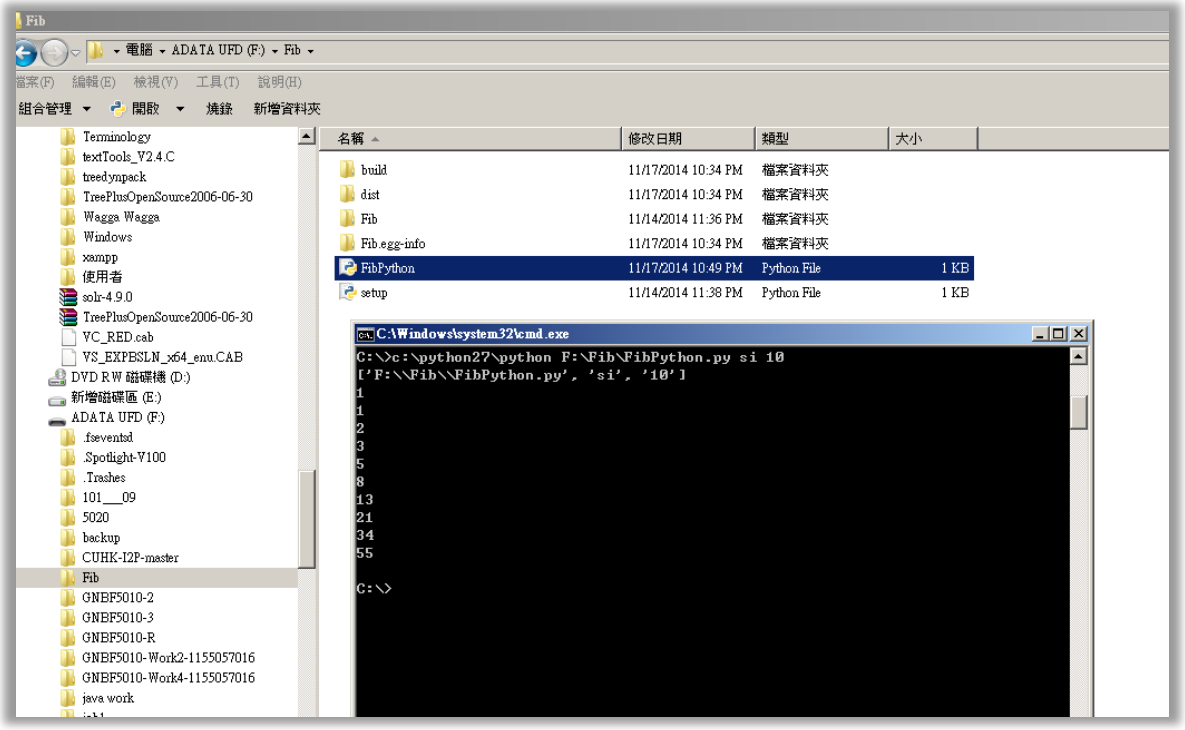
We download easy_install from web then use it to install Fib-0.1-py2.7.egg into python site-packages folder.



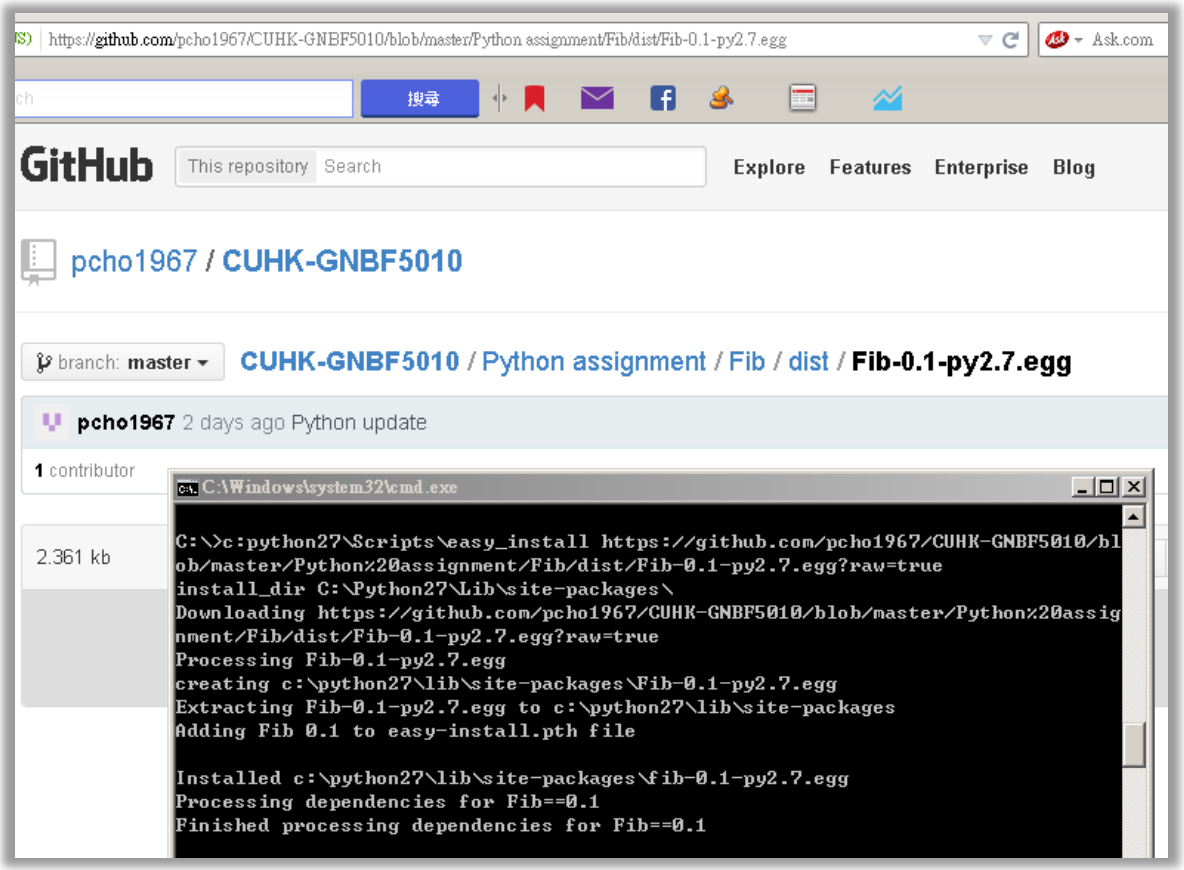
We create FibPython.py to import Fib package and pass parameter through command argument. Example FibPython si 10 which call FibPyhton.py script with call the SimpleIteration (si) algorithm with 10th Fib numbers.

FibPython.py

```
1  import Fib
2
3  #--------------------------------------------------------
4  if __name__ == "__main__":
5      import sys
6      print sys.argv
7      algorithim = sys.argv[1].lower()
8      valFib = int(sys.argv[2])
9      if algorithim == "si":
10         Fib.SimpleIteration(valFib)
11     elif algorithim == "sr":
12         print SimpleRecursive(valFib)
13     elif algorithim == "mr":
14         print MemorizedRecursive(valFib)
15     else:
16         pass
17
```



We can upload the egg file into web and use easy install with the http link to download and install the egg file in a statement as following screen which has same result as install by egg file in hard disk.



I have uploaded the egg file into github, with http link as “https://github.com/pcho1867/CUHK-GBBF5010/blob/master/Python%20assignmebt/Fib/dist/Fib-0.1-py2.7.egg?raw=true”

The demo show the steps to prepare a package or egg of a python code then distribute and install in python and use as import object for other user and code reuse.

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Signature(s)	Date

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GNBF5010	Introduction to programming
Course code	Course title