Data structures in Python

Week 8A: user defined modules

User defined modules

The subprograms namely procedures and functions that are created by user can be used in other programs (import) as well. These are called user defined modules.

math – it is a module/library that contain predefined procedures and functions such as sqrt(), pow(), pi() and more…..

math.py/library file

```
def sqrt(n):
    ...
    ...
    return n

def pi(n):
    n = 3.141592653589793
    return n

def pow(x, y)
    p = 1
    for i in range(y):
        p = p*x
    return p

......
```

Importing module/library

Using sqrt() defined in math

Using pow() from imported math library

mathcheck.py

```
#using math library subprograms
import math #importing math module here

x = 3
y = 2
print(math.sqrt(x))
print(math.pow(x,y))
```

Shell

```
Python 3.7.9 (bundled)
>>> %Run mathcheck.py

  1.7320508075688772
  9.0
```

Attention: It is not a real Python's math library and contents- Just faked here to understand how to define a module with subprograms and reuse it. So, use different name for module instead of math and try this.

- Let us define our own modules and use it in our other programs
- Create a module called **bigSmall** that contain procedure and functions to get smaller or greater than two numbers via sub programs. Then we use those created subprograms in our other programs.

bigSmall.py *

```
#find smaller one
def smallProcedure(x,y):
    if x<y:
        print(x)
    else:
        print(y)

def smallFunction(x,y)
     if x<y:
        return x
    else:
        return y

#find smaller one
def bigProcedure(x,y):
    if x>y:
        print(x)
    else:
        print(y)

def bigFunction(x,y)
     if x>y:
        return x
    else:
        return y
```

findsmallest.py

```
import bigSmall #importing user defined module here

a = int(input("enter the a value:"))
b = int(input("enter the b value:"))
bigSmall.smallProcedure(a,b)

p = float(input("enter the p value:"))
q = float(input("enter the q value:"))
print(bigSmall.bigFunction(p,q))
```

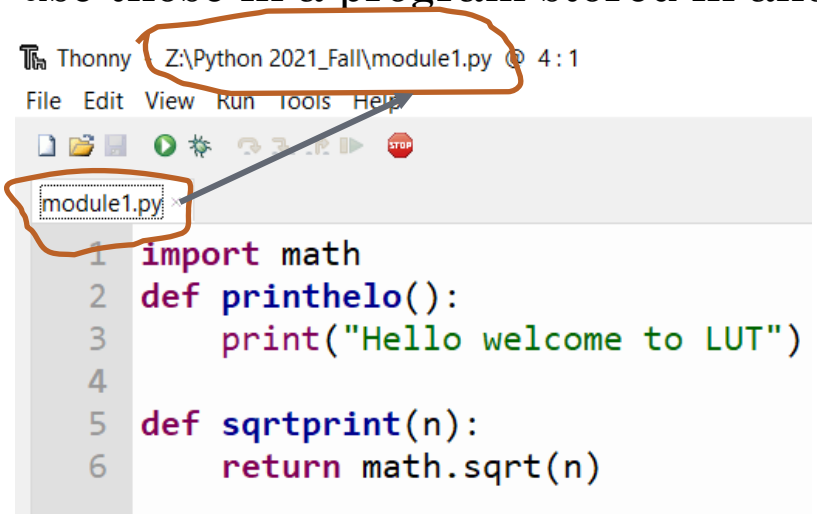
Shell

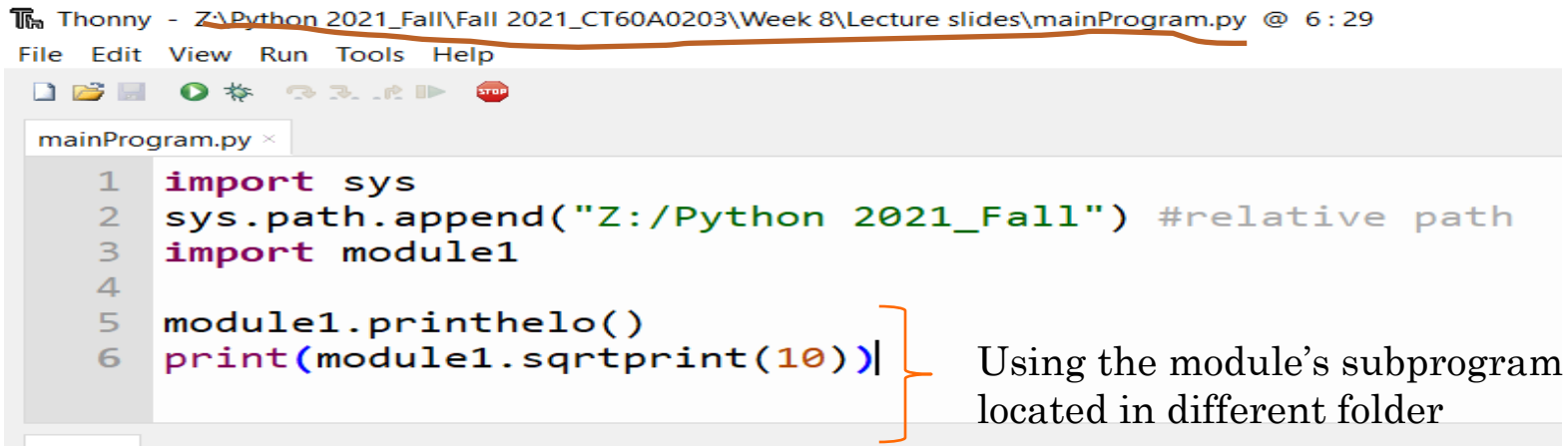
```
Python 3.7.9 (bundled)
>>> %Run findsmallest.py

  enter the a value:34
  enter the b value:45
  34
  enter the p value:-23.56
  enter the q value:-14.5
  -14.5
```

Attention:
The results of called procedure and function totally depending on the way you defined in your module. Keep in mind you are a programmer not the computer. Computer is just a machine which execute the code you supplied.

- How about importing modules from different folder?
- Suppose you have kept a module that with some user-defined subprograms in a different folder and wants to use those in a program stored in another folder.





Using the module's subprogram that located in different folder

https://docs.python.org/3/tutorial/modules.html