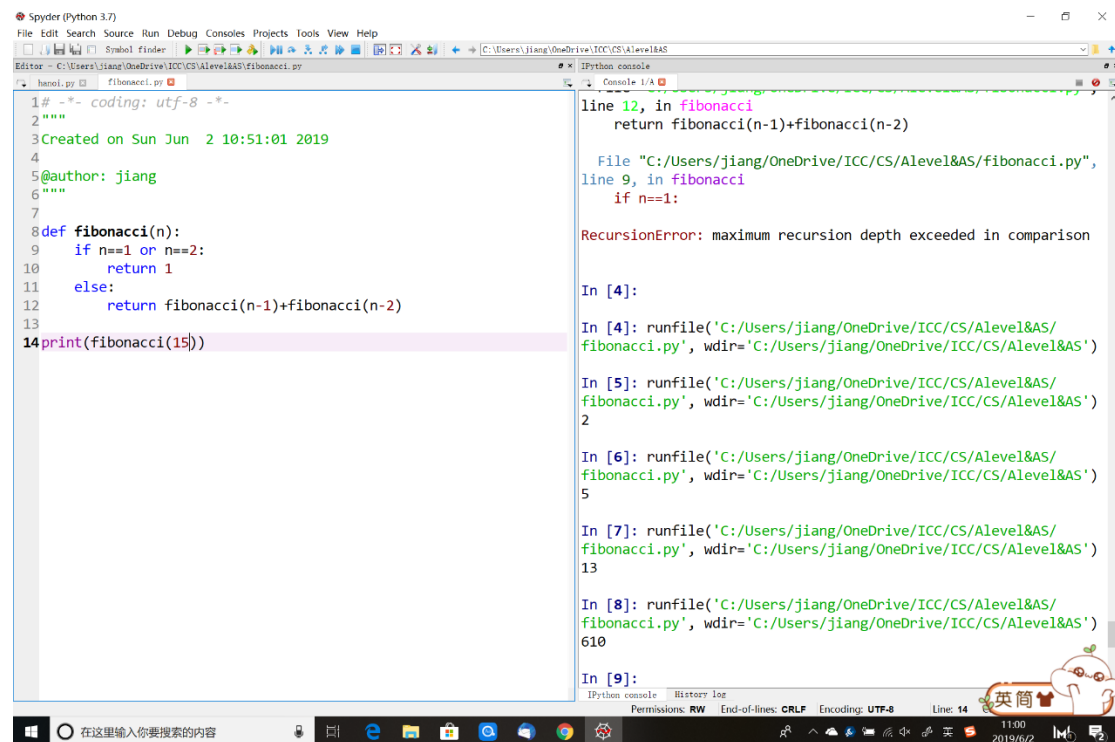


fibonacci



The screenshot shows the Spyder Python IDE with a file named `fibonacci.py` open. The code defines a `fibonacci` function and prints the 15th Fibonacci number. The console shows the execution of the script, including a `RecursionError` message and the output of the function.

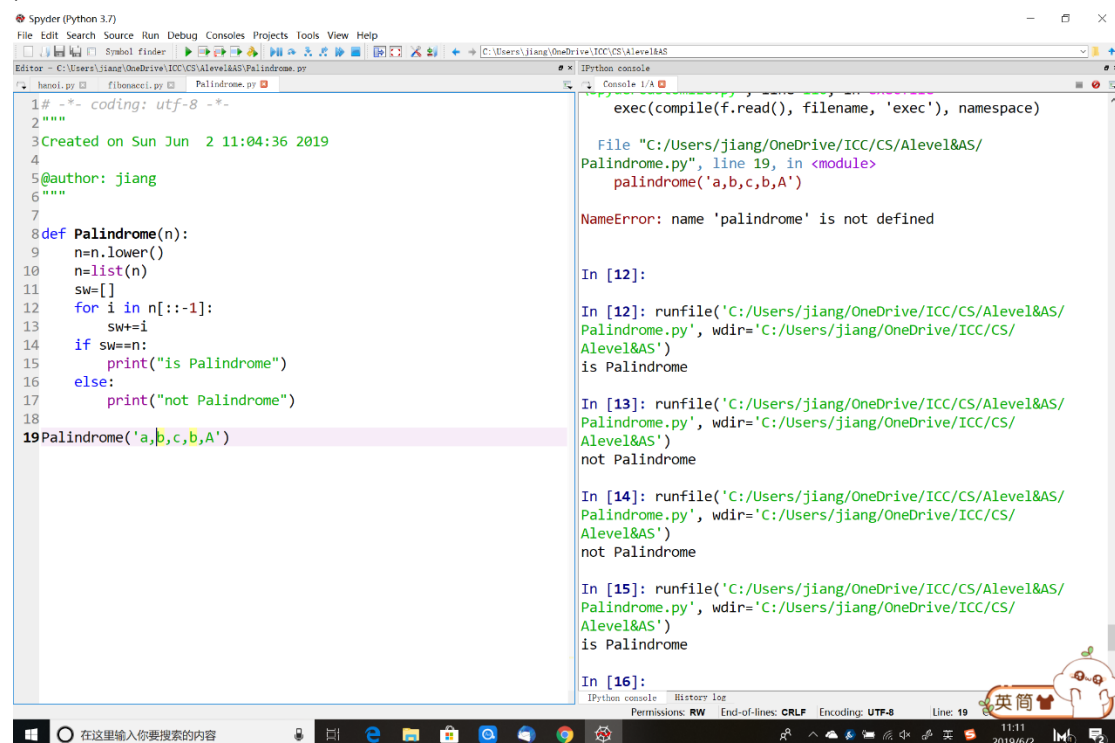
```
1# -*- coding: utf-8 -*-
2"""
3Created on Sun Jun 2 10:51:01 2019
4
5@author: jiang
6"""
7
8def fibonacci(n):
9    if n==1 or n==2:
10        return 1
11    else:
12        return fibonacci(n-1)+fibonacci(n-2)
13
14print(fibonacci(15))
```

Console output:

```
line 12, in fibonacci
    return fibonacci(n-1)+fibonacci(n-2)
File "C:/Users/jiang/OneDrive/ICC/CS/Alevel&AS/fibonacci.py",
line 9, in fibonacci
    if n==1:
RecursionError: maximum recursion depth exceeded in comparison

In [4]:
In [4]: runfile('C:/Users/jiang/OneDrive/ICC/CS/Alevel&AS/
fibonacci.py', wdir='C:/Users/jiang/OneDrive/ICC/CS/Alevel&AS')
In [5]: runfile('C:/Users/jiang/OneDrive/ICC/CS/Alevel&AS/
fibonacci.py', wdir='C:/Users/jiang/OneDrive/ICC/CS/Alevel&AS')
2
In [6]: runfile('C:/Users/jiang/OneDrive/ICC/CS/Alevel&AS/
fibonacci.py', wdir='C:/Users/jiang/OneDrive/ICC/CS/Alevel&AS')
5
In [7]: runfile('C:/Users/jiang/OneDrive/ICC/CS/Alevel&AS/
fibonacci.py', wdir='C:/Users/jiang/OneDrive/ICC/CS/Alevel&AS')
13
In [8]: runfile('C:/Users/jiang/OneDrive/ICC/CS/Alevel&AS/
fibonacci.py', wdir='C:/Users/jiang/OneDrive/ICC/CS/Alevel&AS')
610
In [9]:
```

palindrome



The screenshot shows the Spyder Python IDE with a file named `Palindrome.py` open. The code defines a `Palindrome` function and prints the result of the function. The console shows the execution of the script, including a `NameError` message and the output of the function.

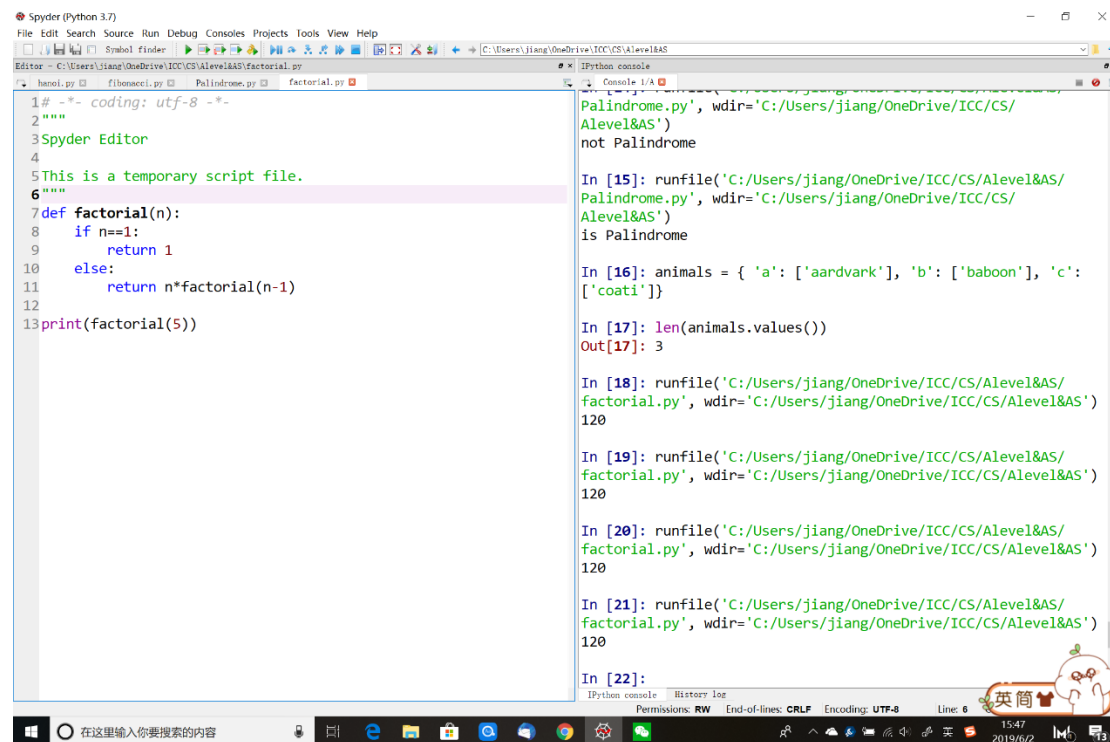
```
1# -*- coding: utf-8 -*-
2"""
3Created on Sun Jun 2 11:04:36 2019
4
5@author: jiang
6"""
7
8def Palindrome(n):
9    n=n.lower()
10    n=list(n)
11    sw=[]
12    for i in n[::-1]:
13        sw+=i
14    if sw==n:
15        print("is Palindrome")
16    else:
17        print("not Palindrome")
18
19Palindrome('a,b,c,b,a')
```

Console output:

```
exec(compile(f.read(), filename, 'exec'), namespace)
File "C:/Users/jiang/OneDrive/ICC/CS/Alevel&AS/
Palindrome.py", line 19, in <module>
    palindrome('a,b,c,b,a')
NameError: name 'palindrome' is not defined

In [12]:
In [12]: runfile('C:/Users/jiang/OneDrive/ICC/CS/Alevel&AS/
Palindrome.py', wdir='C:/Users/jiang/OneDrive/ICC/CS/
Alevel&AS')
is Palindrome
In [13]: runfile('C:/Users/jiang/OneDrive/ICC/CS/Alevel&AS/
Palindrome.py', wdir='C:/Users/jiang/OneDrive/ICC/CS/
Alevel&AS')
not Palindrome
In [14]: runfile('C:/Users/jiang/OneDrive/ICC/CS/Alevel&AS/
Palindrome.py', wdir='C:/Users/jiang/OneDrive/ICC/CS/
Alevel&AS')
not Palindrome
In [15]: runfile('C:/Users/jiang/OneDrive/ICC/CS/Alevel&AS/
Palindrome.py', wdir='C:/Users/jiang/OneDrive/ICC/CS/
Alevel&AS')
is Palindrome
In [16]:
```

factorial



The screenshot shows the Spyder Python IDE with a file named 'factorial.py' open. The code defines a recursive factorial function. The IPython console on the right shows the execution of the script, which prints '120' for factorial(5). The console also shows several other test cases for a palindrome function.

```
1# -*- coding: utf-8 -*-
2"""
3Spyder Editor
4
5This is a temporary script file.
6"""
7def factorial(n):
8    if n==1:
9        return 1
10    else:
11        return n*factorial(n-1)
12
13print(factorial(5))
```

IPython console output:

```
Palindrom.py', wdir='C:/Users/jiang/OneDrive/ICC/CS/Alevel&AS/
Alevel&AS')
not Palindrome

In [15]: runfile('C:/Users/jiang/OneDrive/ICC/CS/Alevel&AS/
Palindrom.py', wdir='C:/Users/jiang/OneDrive/ICC/CS/Alevel&AS/
Alevel&AS')
is Palindrome

In [16]: animals = { 'a': ['aardvark'], 'b': ['baboon'], 'c':
['coati']}

In [17]: len(animals.values())
Out[17]: 3

In [18]: runfile('C:/Users/jiang/OneDrive/ICC/CS/Alevel&AS/
factorial.py', wdir='C:/Users/jiang/OneDrive/ICC/CS/Alevel&AS/
')
120

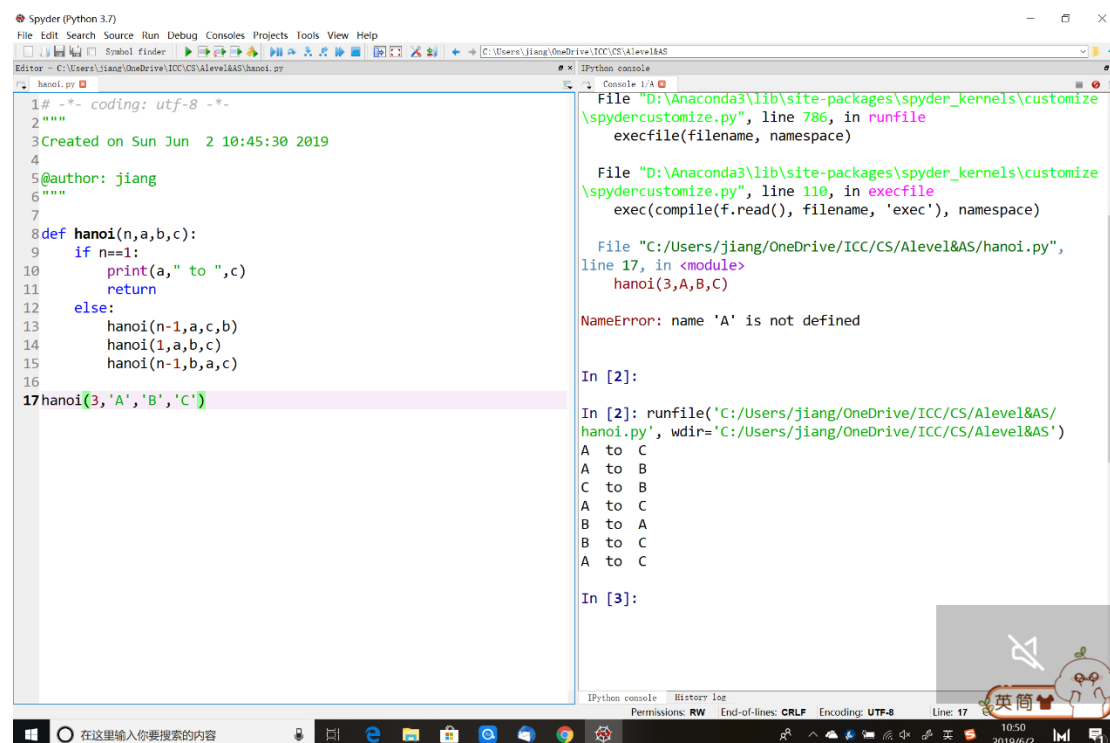
In [19]: runfile('C:/Users/jiang/OneDrive/ICC/CS/Alevel&AS/
factorial.py', wdir='C:/Users/jiang/OneDrive/ICC/CS/Alevel&AS/
')
120

In [20]: runfile('C:/Users/jiang/OneDrive/ICC/CS/Alevel&AS/
factorial.py', wdir='C:/Users/jiang/OneDrive/ICC/CS/Alevel&AS/
')
120

In [21]: runfile('C:/Users/jiang/OneDrive/ICC/CS/Alevel&AS/
factorial.py', wdir='C:/Users/jiang/OneDrive/ICC/CS/Alevel&AS/
')
120

In [22]:
```

hanoi



The screenshot shows the Spyder Python IDE with a file named 'hanoi.py' open. The code defines a recursive Hanoi Tower function. The IPython console on the right shows the execution of the script, which prints the sequence of moves for 3 disks. The console also shows a NameError that was resolved by running the file again.

```
1# -*- coding: utf-8 -*-
2"""
3Created on Sun Jun  2 10:45:30 2019
4
5@author: jiang
6"""
7
8def hanoi(n,a,b,c):
9    if n==1:
10        print(a," to ",c)
11        return
12    else:
13        hanoi(n-1,a,c,b)
14        hanoi(1,a,b,c)
15        hanoi(n-1,b,a,c)
16
17hanoi(3,'A','B','C')
```

IPython console output:

```
File "D:\Anaconda3\lib\site-packages\spyder_kernels\customize
\spydercustomize.py", line 786, in runfile
execfile(filename, namespace)

File "D:\Anaconda3\lib\site-packages\spyder_kernels\customize
\spydercustomize.py", line 110, in execfile
exec(compile(f.read(), filename, 'exec'), namespace)

File "C:/Users/jiang/OneDrive/ICC/CS/Alevel&AS/hanoi.py",
line 17, in <module>
hanoi(3,A,B,C)

NameError: name 'A' is not defined

In [2]:

In [2]: runfile('C:/Users/jiang/OneDrive/ICC/CS/Alevel&AS/
hanoi.py', wdir='C:/Users/jiang/OneDrive/ICC/CS/Alevel&AS/
')
A to C
A to B
C to B
A to C
B to A
B to C
A to C

In [3]:
```

It is a lot more easier to use recursions rather than functions in many cases.