Python Basic Number Numeric Manipulations

Fan Wang

2020-12-18

Contents

1 Numeric Basics

Go to the **RMD**, **PDF**, or **HTML** version of this file. Go back to Python Code Examples Repository (bookdown site) or the pyfan Package (API).

```python
import numpy as np
```

1.1 Simple Integer Loop

Loop over integers up to a maximum number. Take certain actions at the beginning and at the end of the loop. Note that in python, indexing starts at 0, and ends 1 less than the length. So below, *np.arange(4)* generates a list that starts at 0 and goes to 3 of length 4. The last element is not 4. Ending index is 4-1, dont forget the -1.

```python
# Maximum number
it_bisection_iter = 4
# np arange
ls_it_loop = np.arange(it_bisection_iter)
print(f'{ls_it_loop=}')
# Iteration
```

```
## ls_it_loop=array([0, 1, 2, 3])
```

```python
for it_bisection_ctr in ls_it_loop:
    if it_bisection_ctr == 0:
        print('starting index')
    elif it_bisection_ctr == it_bisection_iter-1:
        print('ending index')
    print(f'{it_bisection_ctr=}')
```

```
## starting index
## it_bisection_ctr=0
## it_bisection_ctr=1
## it_bisection_ctr=2
## ending index
## it_bisection_ctr=3
```

1.2 Two Digit Numbers Coding Conditional Information

We have numbers between 0 and 99, these indicate different estimation specifications, where the digit number is the estimation tolerance level, and the tens number is the minimization algorithm.

```python
ls_it_esti_optsalgo = [0, 1, 10, 15, 23, 89, 90, 99, 900, 901, 999, 1000]
for it_esti_optsalgo in ls_it_esti_optsalgo:
    it_esti_optsalgo_tens = int(np.floor(it_esti_optsalgo/10))
    it_esti_optsalgo_digits = it_esti_optsalgo%10
    print(f'{it_esti_optsalgo_tens=}, {it_esti_optsalgo_digits=}')
```

```
## it_esti_optsalgo_tens=0, it_esti_optsalgo_digits=0
## it_esti_optsalgo_tens=0, it_esti_optsalgo_digits=1
## it_esti_optsalgo_tens=1, it_esti_optsalgo_digits=0
## it_esti_optsalgo_tens=1, it_esti_optsalgo_digits=5
## it_esti_optsalgo_tens=2, it_esti_optsalgo_digits=3
## it_esti_optsalgo_tens=8, it_esti_optsalgo_digits=9
## it_esti_optsalgo_tens=9, it_esti_optsalgo_digits=0
## it_esti_optsalgo_tens=9, it_esti_optsalgo_digits=9
## it_esti_optsalgo_tens=90, it_esti_optsalgo_digits=0
## it_esti_optsalgo_tens=90, it_esti_optsalgo_digits=1
## it_esti_optsalgo_tens=99, it_esti_optsalgo_digits=9
## it_esti_optsalgo_tens=100, it_esti_optsalgo_digits=0
```