Problem2

November 25, 2018

0.1 Problem 2

(b) My code of this function shows as follows:

```
In [9]: import numpy as np

        def get_r(K, L, alpha, Z, delta):
            '''This function generates the interest rate or vector of interest rates'''
            ''' Firstly, check the type of inputs '''
            if type(K) != int and type(K) != float and type(K) != np.ndarray:
                raise TypeError('K should be a scalar or vector.')
            if type(L) != int and type(L) != float and type(L) != np.ndarray:
                raise TypeError('L should be a scalar or vector.')
            if type(alpha) != float or type(delta) != float:
                raise TypeError('Both alpha and delta should be float.')
            if type(Z) != int and type(Z) != float:
                raise TypeError('Z should be a integer or float.')

            '''Then, check the value of inputs'''
            if (type(K) != np.ndarray and K <= 0) or (type(K) == np.ndarray and not np.all(K >
        0)):
                raise ValueError("K should be larger than zero")
            if (type(L) != np.ndarray and L <= 0) or (type(L) == np.ndarray and not np.all(L >
        0)):
                raise ValueError("L should be larger than zero")
            if not 0 < alpha < 1:
                raise ValueError("Alpha should in the interval of (0,1).")
            if not Z > 0:
                raise ValueError("Z should be larger than zero")
            if not 0 <= delta < 1:
                raise ValueError("Delta should in the interval of (0,1).")

            '''Finally, make sure the length of K and L are the same'''
            if type(K) == np.ndarray and type(L) == np.ndarray:
                assert len(K) == len(L)

            ''' If the input meet all restrictions, then do the following calculation.'''
            r = alpha * Z * (L / K) ** (1 - alpha) - delta
            return r

In [10]: !py.test --cov
```

```
============================= test session starts ==============================
platform win32 -- Python 3.7.1rc1, pytest-4.0.1, py-1.7.0, pluggy-0.8.0
rootdir: F:\\\\\Perspective\Assignment 7\Problem 2, inifile:
plugins: cov-2.6.0
collected 244 items

test_r.py ... [ 25%]
```

```
... [ 54%]
... [ 84%]
...                                      [100%]

--------- coverage: platform win32, python 3.7.1-candidate-1 ---------
Name        Stmts   Miss  Cover
-------------------------------
get_r.py       24      9    62%
test_r.py      29      0   100%
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TOTAL          53      9    83%


========================== 244 passed in 0.93 seconds ==========================
```

(c) From the above result, we could see that some of codes in get_r.py is missing in the test. We may need a more comprehensive test to cover all cases for this function. However, until now, this function performs well.