HOMEWORK 2

1 . If the range between the two points is 1, then 10^{-3} means that we need to let $2^n \geq 10^3$, then $n \geq 10$. For the same reason, $n \geq \log_2 10^6$, i.e., $n \geq 10$ for 10^{-6}, and $n \geq \log_2 10^9$, i.e., $n \geq 30$ for 10^{-9}.

2 . Define an independent function outside the bisection.py, and cite it in the original program.

3 . The main difference between lists and tuples is the fact that lists are mutable whereas tuples are immutable. Dictionaries states simply a dictionary is a key-value data structure that can be used as an index. I usually use lists, since it is more natural and easy to change. While tuples are used when things cannot be moved.

4 . Almost every types of variables can be checked by merely a single function, isinstance. For example:

```python
a = 1
b = [1,2,3,4]
c = (1,2,3,4)
d = {'a':1,'b':2,'c':3}
e = "abc"
if isinstance(a,int):
print "a is int"
else:
print "a is not int"
if isinstance(b,list):
print "b is list"
else:
print "b is not list"
if isinstance(c,tuple):
print "c is tuple"
else:
print "c is not tuple"
if isinstance(d,dict):
print "d is dict"
else:
print "d is not dict"
```
Cheers!

Haobo Yan
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