69. Sqrt(x)

Total Accepted: **77143** Total Submissions: **318248** Difficulty: **Medium**

> Implement `int sqrt(int x)`.
>
> Compute and return the square root of *x*.
>
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This problem is, in fact, a binary search problem.
Because, mathematically, sqrt(n) <= n/2 +1.
We just need to find the answer between the range of [0, n/2+1]

Code:

```
3  class Solution(object):
4      def mySqrt(self, x):
5          if x<=1:
6              return x
7          left, right = 0, x/2+1
8          while left <= right :
9              mid = (left+right)/2
10             square = mid * mid
11             if square == x:
12                 return mid
13             elif square < x:
14                 left = mid +1
15             else:
16                 right = mid-1
17         return right
```

Another solution is Newton method:
How ever, leetCode return a TIme Limit Exceed exception when using Python. It works when I use Java.

```python
class Solution(object):
    def mySqrt(self, x):

        guess = 4
        epsilon = 1e-4
        done = False
        while not done:
            guess = (guess+x/guess) /2
            if abs(guess*guess -x) < epsilon:
                done = True

        return guess

```