440. K-th Smallest in Lexicographical Order

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- Total Accepted: **1425**
- Total Submissions: **7020**
- Difficulty: **Hard**
- Contributors: **Stomach_ache**

Given integers n and k, find the lexicographically k-th smallest integer in the range from 1 to n.

Note: $1 \le k \le n \le 10^9$.

Example:

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```
Input:
n: 13   k: 2

Output:
10

Explanation:
The lexicographical order is [1, 10, 11, 12, 13, 2, 3, 4, 5, 6, 7, 8, 9], so the second smallest number is 10.
```

```
public int findKthNumber2(int n, int k) {
  k = k-1;
  int cur = 1; int steps;
  while(k>0)
  {
     steps = calculateSteps(n,cur,cur+1);
     if(steps<=k)
     {
          k-=steps;
          cur = cur+1;// zhewei i.e., 3-->4 3, 30 ,31,32,....300, 4
the distance
          //between 3 and 4 is 'steps'
     }else{
          k-=1;// zhewei i.e., 2-->20  2 and 20 are neighbors so k
```

```
                    = k-1
            cur = cur*10;
        }
    }
        return cur;
}

public static int calculateSteps(int n,int n1,int n2)
{
        int steps = 0;
        while(n1<=n)
        {
            steps += Math.min(n+1, n2) - n1;
            n1*=10;
            n2*=10;
        }
        return steps;
}
```