

2002 Sun Microsystems and TopCoder Collegiate Challenge – Problem Statement

NumList PROBLEM STATEMENT:

Given positive integers n and k , return the k th integer in the lexically ordered list of integers 1 through n inclusive.

e.g. The integers 1 through 15 ordered lexically are:

1,10,11,12,13,14,15,2,3,4,5,6,7,8,9

e.g. The integers 1 through 123 ordered lexically are:

1,10,100,101,...,122,123,13,14,...,98,99

DEFINITION:

Class: NumList
Method: getKth
Parameters: int,int
Returns: int
Method Signature (be sure your method is public): int getKth(int n, int k);

TOPCODER WILL ENSURE:

* $1 \leq n \leq 100000000$
* $1 \leq k \leq n$

NOTES:

* The index k is a one-based index. $k=1$ refers to the first integer in the list. $k=n$ refers to the last integer in the list.
* lexical ordering is also known as alphabetical ordering or dictionary ordering. It's the ordering induced by comparing integers as strings.

EXAMPLES:

1. $n=15$
 $k=1$
getKth returns 1
2. $n=15$
 $k=8$
getKth returns 2
3. $n=15$
 $k=15$
getKth returns 9
4. $n=123$
 $k=3$
getKth returns 100
5. $n=123$
 $k=123$
getKth returns 99
6. $n=8293$
 $k=1234$
getKth returns 2108