Given string num representing a non-negative integer num, and an integer k, return *the smallest possible integer after removing* k *digits from* num.

**Example 1:**

Input: num = "1432219", k = 3  
Output: "1219"  
Explanation: Remove the three digits 4, 3, and 2 to form the new number 1219 which is the smallest.

**Example 2:**

Input: num = "10200", k = 1  
Output: "200"  
Explanation: Remove the leading 1 and the number is 200. Note that the output must not contain leading zeroes.

**Example 3:**

Input: num = "10", k = 2  
Output: "0"  
Explanation: Remove all the digits from the number and it is left with nothing which is 0.

**Constraints:**

* 1 <= k <= num.length <= 105
* num consists of only digits.
* num does not have any leading zeros except for the zero itself.