1. Given an integer k and a string s, find the length of the longest substring that contains at most k distinct characters.

For example, given s = "abcba" and k = 2, the longest substring with k distinct characters is “bcb"

2.Given an array of integers and a number k, where 1 <= k <= length of the array, compute the maximum values of each subarray of length k.

For example, given array = [10, 5, 2, 7, 8, 7] and k = 3, we should get: [10, 7, 8, 8], since:

10 = max(10, 5, 2)

7 = max(5, 2, 7)

8 = max(2, 7, 8)

8 = max(7, 8, 7)

Do this in O(n) time and O(k) space. You can modify the input array in-place and you do not need to store the results. You can simply print them out as you compute them.

3.

A builder is looking to build a row of N houses that can be of K different colors. He has a goal of minimizing cost while ensuring that no two neighboring houses are of the same color.

Given an N by K matrix where the n^{th} row and k^{th} column represents the cost to build the n^{th} house with k^{th} color, return the minimum cost which achieves this goal.

4. Given an array of time intervals (start, end) for classroom lectures (possibly overlapping), find the minimum number of rooms required.

For example, given [(30, 75), (0, 50), (60, 150)], you should return 2.

5. Given a dictionary of words and a string made up of those words (no spaces), return the original sentence in a list. If there is more than one possible reconstruction, return any of them. If there is no possible reconstruction, then return null.

For example, given the set of words 'quick', 'brown', 'the', 'fox', and the string "thequickbrownfox", you should return ['the', 'quick', 'brown', 'fox'].

Given the set of words 'bed', 'bath', 'bedbath', 'and', 'beyond', and the string "bedbathandbeyond", return either ['bed', 'bath', 'and', 'beyond] or ['bedbath', 'and', 'beyond'].