Kth Smallest Element in a Sorted Matrix

Try to solve the Kth Smallest Element in a Sorted Matrix problem.

We'll cover the following

Statement

Find the k^{th} smallest element in an $(n \times n)$ matrix, where each row and column of the matrix is sorted in ascending order.

Although there can be repeating values in the matrix, each element is considered unique and, therefore, contributes to calculating the k^{th} smallest element.

Constraints:

- `n` $==$ `matrix.length`
- `n` $==$ `matrix[i].length`
- $1 \leq$ `n` ≤ 300
- $-10^9 \leq$ `matrix[i][j]` $\leq 10^9$
- $1 \leq$ `k` $\leq n^2$

Examples

Sample example 1

Input matrix

2	6	8
3	6	10
5	8	11

Kth element to find

`k = 5`

Output

`[2, 3, 5, 6, 6, 8, 8, 10, 11]`

If k is 5, the required result is the 5th element of the matrix, with the value 6.

Test your understanding of the problem

Let's take a moment to make sure you've correctly understood the problem. The quiz below helps you check if you're solving the correct problem:

K^{th} Smallest Element in a Sorted Matrix

1 What is the correct output if the following matrix and value of k is given as input?

$$matrix = \begin{bmatrix} 1 & 5 & 9 \\ 10 & 11 & 13 \\ 12 & 13 & 15 \end{bmatrix}$$

$$k = 8$$

A) 12

B) 13

C) 14

Submit Answer

Question 1 of 3
0 attempted

Reset Quiz

Figure it out!

We have a game for you to play. Rearrange the logical building blocks to develop a clearer understanding of how to solve this problem.

Drag and drop the cards to rearrange them in the correct sequence.

Push the first element of each row of the matrix in a min-heap.

Remove the top (root) of the min-heap.

If the popped element has the next element in its row, push that element to the heap.

If k elements have been removed from the heap, return the last popped element.

Reset | Show Solution | Submit

Try it yourself

Implement your solution in the following coding playground:

usercode > KthSmallest.java

```java
import java.util.*;

class KthSmallest {
    public static int kthSmallestElement(int[][] matrix, int k) {

        // Your code will replace this placeholder return statement
        return -1;
    }

}
```

Powered by AI | Submit

Test Cases | Results

Case 1 | Case 2 | Case 3

Input #1

[[2,6,8],[3,7,10],[5,8,11]]

Input #2

3

Kth Smallest Element in a Sorted Matrix

Back

Solution: Merge K Sort...

Next

Solution: Kth Smallest...

Mark as Completed