

Problem Solving Techniques 문제해결

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Exercise B

- 5 points

- The exercise is not evaluated in detail but evaluated as Pass/Fail.
- (Note that each homework will be about 100 points.)

- Why 5 points?

- I want all students to solve this exercise to participate in-class discussion for the exercise.

- Report submission (no code submission)

- Due date: 3/15 23:59 (no late submission accepted)
- Submission site: <https://icampus.skku.edu/>
- Submission format: [Template] Report for exercise/homework
 - File name: yourid_EX_B.pdf
 - Example: 2000123456_EX_B.pdf

Exercise B

- Finding k
 - There is an $N \times N$ matrix. All elements in each row and column are sorted in an ascending order.
 - Find **ALL** k efficiently (i.e., with a minimum number of elements to be accessed).
 - Develop a way to find any single k (or prove no k) with the minimum number of elements to be accessed in the worst case.
 - For example, for 5×5 matrix, there are 3 problems for k,
 - A: the number of elements to be accessed: 3, 5, 7
 - B: the number of elements to be accessed: 6, 6, 6
 - Then, A's performance is 7 and B's performance is 6; so B's solution is better.

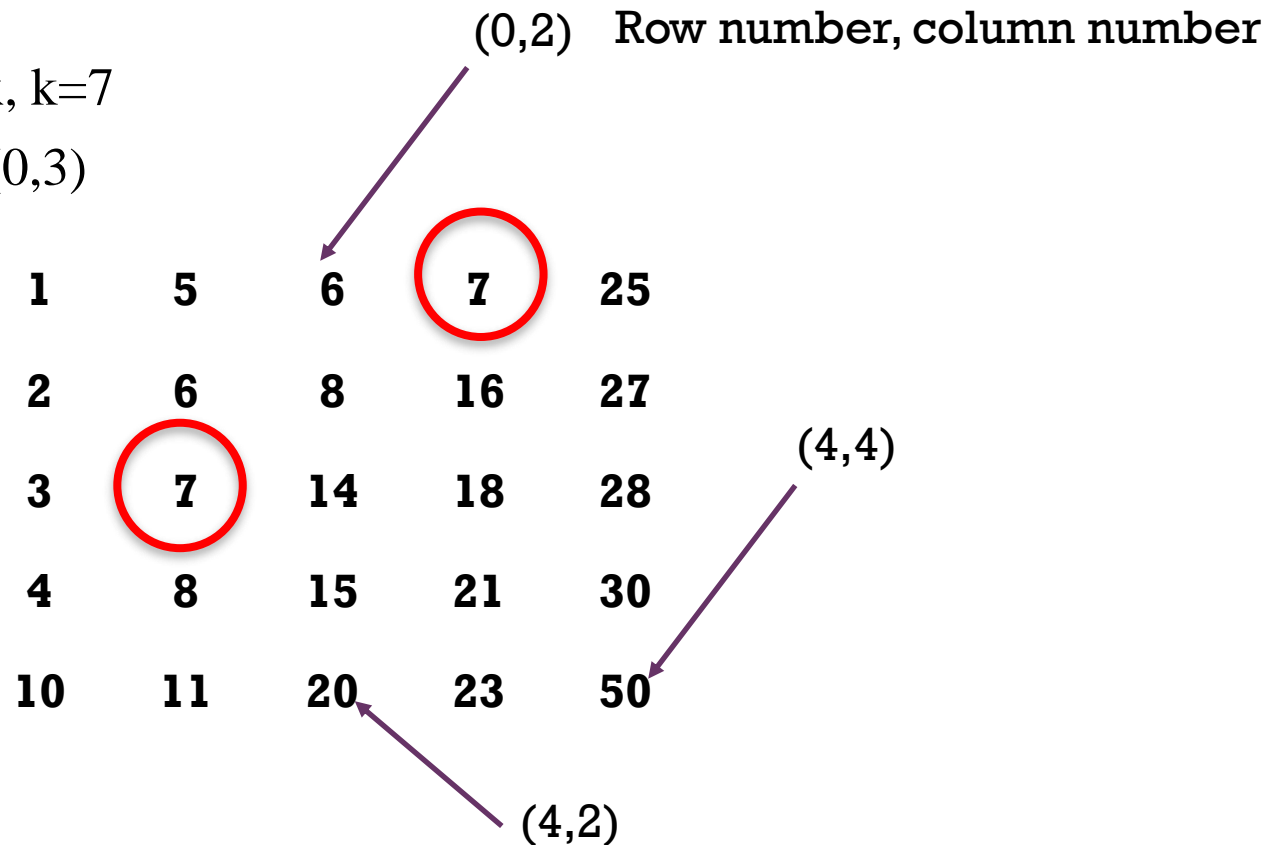
Exercise B

■ Problem

- Find **ALL** k efficiently (i.e., with a minimum number of elements to be accessed).

■ Example

- Input: 5 x 5 matrix, $k=7$
- Output: (2,1) **OR** (0,3)



Exercise B

■ Problem

- Find **ALL** k efficiently (i.e., with a minimum number of elements to be accessed).

■ Example

- Input: 5 x 5 matrix, $k=9$
- Output: “There is no k .”

(0,2) Row number, column number

1	5	6	7	25
2	6	8	16	27
3	7	14	18	28
4	8	15	21	30
10	11	20	23	50

(4,4)

(4,2)

Exercise B

■ Problem

- Find **ALL** k efficiently (i.e., with a minimum number of elements to be accessed).

■ Example

- Input: 5 x 5 matrix, $k=9$
- Output: (0,0), (0,1), (0,2), (0,3), (0,4), (1,0), ... AND (4,4)

