

# The Less I Know The Better

Input file:            **standard input**  
Output file:          **standard output**  
Time limit:           2 seconds  
Memory limit:        256 megabytes

Evirir the dragon has written  $N$  pages on Informatics Olympiad. For each integer  $i = 0, 1, \dots, N - 1$ , there is one page with  $i$  *knowledge*. Evirir will bind the pages into a book. Formally, Evirir will choose a sequence of  $N$  **distinct** integers  $A_0, A_1, \dots, A_{N-1}$  from 0 to  $N - 1$ . Then, it will make a book such that page  $i$  ( $0 \leq i \leq N - 1$ ) has knowledge  $A_i$ .

Due to ancient dragon laws, the knowledge of some pages is fixed. The laws specify  $N$  integers  $B_0, B_1, \dots, B_{N-1}$ . For each  $0 \leq i \leq N - 1$ , if  $B_i \neq -1$ , then  $A_i = B_i$  must hold. There are  $K$  values of  $B_i$  for which  $B_i \neq -1$ .

Evirir wants its  $M$  students, numbered  $0, 1, \dots, M - 1$ , to read the entire book. However, having low attention spans, each student  $i$  will only read pages  $L_i, L_i + 1, \dots, R_i$ . The *knowledge gain* of a student is the sum of the knowledge of the pages that are read by the student.

What is the maximum possible total knowledge gain of all students if Evirir binds the pages optimally?

## Input

The first line contains three space-separated integers,  $N$ ,  $M$ , and  $K$ .

The second line contains  $N$  space-separated integers,  $B_0, B_1, \dots, B_{N-1}$ .

Then,  $M$  lines follow, where the  $i$ -th line contains two space-separated integers,  $L_i$  and  $R_i$ .

## Output

Output an integer, the maximum possible total knowledge gain of all students.

## Scoring

For all test cases, the input will satisfy the following constraints:

- $1 \leq N \leq 5 \cdot 10^5$
- $1 \leq M \leq 10^5$
- $0 \leq K \leq N$
- $-1 \leq B_i \leq N - 1$  for all  $0 \leq i \leq N - 1$
- There are exactly  $K$  values of  $i$  such that  $B_i \neq -1$
- All fixed values are distinct: if  $B_i \neq -1$  and  $B_j \neq -1$  and  $i \neq j$ , then  $B_i \neq B_j$
- $0 \leq L_i \leq R_i \leq N - 1$  for all  $0 \leq i \leq M - 1$

Subtask	Points	Additional constraints
1	15	$N, M \leq 5000, K = N$
2	10	$N, M \leq 5000, K = 0, (L_i, R_i) = (L_0, R_0)$ for all $0 \leq i \leq M - 1$
3	25	$N, M \leq 5000, K = 0$
4	15	$N, M \leq 5000$
5	10	$L_i = 0$ for all $0 \leq i \leq M - 1$
6	25	—

## Examples

standard input	standard output
5 2 5 3 4 1 0 2 0 2 1 4	15
5 3 2 2 -1 -1 1 -1 2 2 0 0 3 4	10
5 3 0 -1 -1 -1 -1 -1 1 3 4 4 0 4	20

## Note

### Example 1

This example is valid for subtasks 1, 4, and 6.

Evirir wrote  $N = 5$  pages and has  $M = 2$  students. All  $K = N$  pages are fixed.

- Student 0 reads pages 0 to 2 and gains  $3 + 4 + 1 = 8$  knowledge.
- Student 1 reads pages 1 to 4 and gains  $4 + 1 + 0 + 2 = 7$  knowledge.

Therefore, the total knowledge gain is  $8 + 7 = 15$ .

### Example 2

This example is valid for subtasks 4 and 6.

$K = 2$  pages are fixed: 0 and 3. One optimal way to bind the pages is  $A = [2, 0, 4, 1, 3]$ .

- Student 0 reads pages 2 to 2 and gains 4 knowledge.
- Student 1 reads pages 0 to 0 and gains 2 knowledge.
- Student 2 reads pages 3 to 4 and gains  $1 + 3 = 4$  knowledge.

The total knowledge gain is  $4 + 2 + 4 = 10$ . Note that there may be other optimal ways to bind the pages.

Some examples of  $A$  that Evirir cannot choose:

- $A = [4, 0, 3, 1, 2]$ : Page 0 is fixed to be  $B_0 = 2$ , but here  $A_0 = 4$ .
- $A = [2, 4, 4, 1, 4]$ : The knowledge of the pages is not distinct.
- $A = [2, 3, 5, 1, 4]$ : The knowledge of the pages must be between 0 and  $N - 1$ .

### Example 3

This example is valid for subtasks 3, 4, and 6.

Since  $K = 0$ , no pages are fixed. One optimal way to bind the pages is  $A = [0, 4, 2, 1, 3]$ .

- Student 0 reads pages 1 to 3 and gains  $4 + 2 + 1 = 7$  knowledge.
- Student 1 reads pages 4 to 4 and gains 3 knowledge.
- Student 2 reads pages 0 to 4 and gains  $0 + 4 + 2 + 1 + 3 = 10$  knowledge.

The total knowledge gain is  $7 + 3 + 10 = 20$ .