

Problem Statement

You are given the data of N cars numbered from $1, 2, \dots, N$, where each car is initially at origin and moving towards the same direction. For each of the N cars, you are given the initial velocity of each car (u_i) and acceleration of each car (a_i).

You are asked Q queries. Each query is of the form (l, r, t_1, t_2) consisting of 4 integers which denote the following information:

- l denotes the starting index of the car to be considered.
- r denotes the last index of the car to be considered.
- t_1 denotes the time at which we start measuring the displacement of cars in the given range.
- t_2 denotes the time till which we will measure the displacement of cars in the given range.

The answer to each query is the total displacement traveled by all the cars in range l to r both inclusive between time t_1 and t_2 .

Your task is to find the sum of answers for each query modulo 10^9+7 .

```
1 #include <vector>.h
2 #include <ctype>.h
3 #include <limits>.h
4 #include <math>.h
5 #include <stdbool>.h
6 #include <stddef>.h
7 #include <stdint>.h
8 #include <stdio>.h
9 #include <stdlib>.h
10 #include <string>.h
11 #include <string.h>
12
13 char* getline();
14 char* trim(char*);
15 char** splitString(char*);
16
17
18 int distanceTravel(int N, int Q,
19     // write your code here
20
21 }
22
23
```

Problem Statement

You will be given two arrays: A of length N, and B of length M.

The following sub-arrays are defined below:

- S1: a sub-array of A resulting by taking a subset of size X of indices from A and replacing each index i with value A[i], then concatenating the taken elements into one array S1. For example: if A = [1, 2, 7, 8]. We can take subset of indices {1, 2, 4} which have values {1, 2, 8}. Then S1 = [1, 2, 8]
- S2: a sub-array of B resulting by taking a subset of size X of indices from B and replacing each index i with value B[i], then concatenating the taken elements into one array S2 (Not necessarily the same indices taken from A, but the size is the same as S1, which is X).

A pair (S1, S2) is called Beautiful if $S1[i] = S2[i]$ for all $(1 \leq i \leq X)$.

Your task is to find the total number of different pairs of subsets that would result in a Beautiful pair of (S1, S2). Since, the answer might be very large you need to print it modulo 10^9+7 .

Select language

Python 3

Select theme

base16-dark

```
1 import sys
2
3
4 def getCount(N, M, A, B):
5     # write your code here
6
7
8
9 def main():
10     N = int(sys.stdin.readline().strip())
11
12     M = int(sys.stdin.readline().strip())
13
14     A = []
15     for _ in range(N):
16         A.append(int(sys.stdin.readline().strip()))
17
18     B = []
19     for _ in range(M):
20         B.append(int(sys.stdin.readline().strip()))
21
```

$$1 \leq N \leq 10^5$$

$$1 \leq K \leq 10^9$$

$$1 \leq |A_i| \leq 10^9$$

Sample Input	Sample Output	Explanation
3 7 7 2 6	3	OR of all elements is 7 that is $\leq K$ so the length of maximum subarray is 3. Hence the answer is 3.
4 1 1 4 4 6	1	We can choose only the element 1 from the array so answer is subarray of length 1.

```
2 #include <string.h>
3 #include <limits.h>
4 #include <math.h>
5 #include <stdbool.h>
6 #include <stddef.h>
7 #include <stdint.h>
8 #include <stdio.h>
9 #include <stdlib.h>
10 #include <string.h>
11 #include <string.h>
12
13 char* readline();
14 char* trim(char*);
15
16
17 int longestLength(int N, int K, int*
18     // write your code here
19
20 }
21
22
23 int main() {
```

Note

1. It is given that a is always even for all the cars.
2. It is given that for each query $1 \leq l \leq r \leq N$
3. It is given that for each query $1 \leq t \leq 12$.
4. It is given that $\text{Displacement} = (\text{Initial velocity}) * (\text{time}) + (1/2) * (\text{acceleration}) * (\text{time}^2)$.
5. It is given that displacement is in m.
6. It is given that velocity is in m/s.
7. It is given that acceleration is in m/s^2 .
8. It is given that all time is given in seconds.

Input Format

The first line contains an integer, N , denoting the number of elements in U .

The next line contains an integer, Q , denoting the number of rows in Queries.

Each line i of the N subsequent lines (where $0 \leq i < N$) contains an integer describing $U[i]$.

Each line i of the N subsequent lines (where $0 \leq i < N$) contains an integer describing $A[i]$.

Each line i of the Q subsequent lines (where $0 \leq i < Q$) contains 4 space separated integers each describing the row Queries $[i]$.

The 4 space separated integers denote values of (l, r, t_1, t_2) for each query as

```
2 #include <ctype.h>
3 #include <limits.h>
4 #include <math.h>
5 #include <stdbool.h>
6 #include <stddef.h>
7 #include <stdint.h>
8 #include <stdio.h>
9 #include <stdlib.h>
10 #include <string.h>
11 #include <string.h>
12
13 char* getline();
14 char* trim(char*);
15 char** splitString(char*);
16
17
18 int distanceTravel(int N, int Q, int* U, int* A) {
19     // write your code here
20
21 }
22
23
```

Problem Statement

You are given an array A of size N. Your task is to find the maximum length of a subarray whose bitwise OR is less than equal to K. If there are no subarrays possible with Bitwise OR $\leq K$ then return 0.

Notes

- Bitwise OR of a subarray from (L) is $=A_L | A_{L+1} | \dots | A_R$. Where $|$ denotes bitwise OR operation.

Input Format

The first line contains an integer, N, denoting the number of elements in A.

The next line contains an integer, K, denoting the value of K.

Each line i of the N subsequent lines (where $0 \leq i < N$) contains an integer describing A[i].

```
1 #include <vector.h>
2 #include <ctype.h>
3 #include <limits.h>
4 #include <math.h>
5 #include <stdbool.h>
6 #include <stddef.h>
7 #include <stdint.h>
8 #include <stdio.h>
9 #include <stdlib.h>
10 #include <string.h>
11 #include <string.h>
12
13 char* readline();
14 char* trim(char*);
15
16
17 int longestLength(int N, int K, int* A) {
18     // write your code here
19
20 }
21
22
23 int main() {
```

A pair (S1, S2) is called Beautiful if $S1[i] = S2[i]$ for all $(1 \leq i \leq X)$.

Your task is to find the total number of different pairs of subsets that would result in a Beautiful pair of (S1, S2). Since, the answer might be very large you need to print it modulo 10^9+7 .

Input Format

The first line contains an integer, N, denoting the number of elements in A.

The next line contains an integer, M, denoting the number of elements in B.

Each line i of the N subsequent lines (where $0 \leq i < N$) contains an integer describing $A[i]$.

Each line i of the M subsequent lines (where $0 \leq i < M$) contains an integer describing $B[i]$.

Constraints

$$1 \leq N \leq 10^3$$

$$1 \leq M \leq 10^3$$

$$1 \leq A[i] \leq 10^5$$

$$1 \leq B[i] \leq 10^5$$

Select language

Python 3

```
1 import sys
2
3
4 def getCount(N, M, A, B):
5     # Write your code here
6
7
8
9 def main():
10     N = int(sys.stdin.readline())
11
12     M = int(sys.stdin.readline())
13
14     A = []
15     for _ in range(N):
16         A.append(int(sys.stdin.readline()))
17
18     B = []
19     for _ in range(M):
```