Radio Reform

There are N cities on the Balkan coast, indexed from 0 to $N-1$. As radio frequencies coming from Italy are too strong, new radio towers have to be installed.

There are M types of radio towers. The i-th type has a covering magnitude L_i. A tower of magnitude X can cover X consecutive cities, i.e., it can cover an interval of length X. There is no restriction on how many towers of the same type can be used.

To ensure functionality, there are additional rules:

- Radio towers can be placed such that their covering intervals overlap; however, for two radio towers of the same type, overlapping is **not allowed** (they cannot cover the same city).
- Two different types of towers can have the same magnitude, in which case overlapping is allowed.

After placing towers, each city is either covered by some radio tower, or it is not. It is **not important** if some city is covered by multiple radio towers. For each city, we define the happiness H_i, that city i will feel if it is covered by a new radio tower. This number **may be negative** because some cities might like to listen to Italian radio.

After placing towers, covered cities naturally split into groups of consecutive cities such that groups are non adjacent (two adjacent groups would merge into one). The number of such groups has to be **exactly** K.

If a city is covered, it contributes to the overall happiness by H_i. If it isn't, its contribution is 0.

Find the maximum overall happiness that can be achieved while ensuring that the number of covered groups is exactly K. It is guaranteed that a solution exists.

Implementation Details

- Include the header file `radio.h`.
- Implement the following function:

```
long long radio(int N, int M, int K, vector < int > H, vector < int > L);
```

  This function should return the answer to the problem.
- The number of cities is denoted by N.
- The number of types of radio towers is denoted by M.
- The number of groups is denoted by K.
- The covering magnitude of the i-th tower is $L[i]$.
- The happiness value of the i-th city is $H[i]$.

Constraints

- $1 \leq N, M, K \leq 10^5$
- $1 \leq L_i \leq N$
- $0 \leq |H_i| \leq 10^5$

Scoring

Subtask	Points	Additional Constraints
1	17	$N, K \leq 100$; $M = 1$
2	15	$N, M, K \leq 100$
3	15	$N, M, K \leq 500$
4	13	$N \leq 5000$; $M, K \leq 100$
5	14	$N, M \leq 50\,000$; $K \leq 30$
6	26	No further constraints.

Sample Grader

The sample grader takes input in the following format:

- **Line 1**: $N \ M \ K$
- **Line 2**: $H_1, H_2, \ldots, H_N$
- **Line 3**: $L_1, L_2, \ldots, L_M$

After that, the grader calls the function `radio`, and outputs the value received.

Examples

Example 1:

Let $N = 5$, $M = 1$, $K = 1$, $H = [2, 2, -6, 2, 2]$, $L = [3]$. Since there is only one type of radio tower and it has magnitude 3, at most one tower can be placed. Any interval choice for this tower will have two 2's and one -6, so the sum is -2.

The function is called in the following way:

```
radio(5, 1, 1, [2, 2, -6, 2, 2], [3])
```

Example 2:

Let $N = 5$, $M = 2$, $K = 1$, $H = [2, 2, -6, 2, 2]$, $L = [3, 3]$. Using only one tower of magnitude 3 guarantees the inclusion of -6 in the sum. Using two towers of magnitude 3 allows us to cover the whole interval, so the answer is $2 + 2 - 6 + 2 + 2 = 2$. Even though in the previous example we also had the option to use radio towers with magnitude 3, they couldn't overlap because they were of the same type, but now we have two types of radio towers with magnitude 3 which have the same magnitude.

The function is called in the following way:

```
radio(5, 2, 1, [2, 2, -6, 2, 2], [3, 3])
```

Example 3:

Let $N = 5$, $M = 1$, $K = 2$, $H = [1, 1, 1, 1, -100]$, $L = [2]$. The answer is **-97**. because even though we can put two towers next to each other, they wouldn't form 2 groups that way.

The function is called in the following way:

```
radio(5, 1, 2, [1, 1, 1, 1, -100], [2])
```