Minimum Energy

Input file:	`standard input`
Output file:	`standard output`
Time limit:	1 second
Memory limit:	256 megabytes

You are controlling a bat which is looking for food in a forest. The forest has a row of n trees. This row is represented by an array T[0,...n-1]. A tree situated at the i'th position has a unique number T[i]. The bat is initially on the j'th tree.From this position, the bat is free to move to any other j in the array T(except its current j). This holds true for each subsequent j as well. If k is the index of the tree with food in it, T[k] = 0.

Furthermore, each tree has a height given by a separate array h[0,...,n-1]. So h(i) is the height of the tree at position i. A jump from tree i to tree j costs energy. This energy is given by the expression:

energy = (h(j) - h(i))^3 + (i - j)^2 : If h(j) > h(i) and

energy = (i - j)^2 : otherwise

Please note that only one of the above two expressions for energy will be valid at any one time.

Your task is to find the minimum energy to reach the tree with food.

Input

The first line contains two integers init and n representing the initial position of the bat and the number of trees respectively.

The second line consists of n integers separated by space. Each integer corresponds to the unique number one of the n trees.

The third line consists of n integers separated by space. Each integer corresponds to the height of one tree in the row.

Constraints :

1.) $1 \leq$ T.length ≤ 10

2.) $0 \leq$ T[i] $< 10^9$

3.) $0 \leq$ init $<$ T.length

4.) $100 \leq$ h[i] $\leq 10^4$

Output

The output will be as follows:

Output a single integer corresponding to the minimum energy required to reach the tree with food in it.

Example

standard input	standard output
2 9 1 2 3 4 0 6 7 8 9 10000 3345 4020 220 5000 2367 5689 10000 2300	941192004