L Zayandeh Rud

Time limit: 1.0s
Memory limit: 256MB

Zayandeh Rud is a river that passes through Isfahan, partitioning the city into two parts. Isfahani people love to walk on its riverside, and there are parks near the river on both sides. There are many bridges on the river, most of which have a historical background.

Abbas Agha and Agha Javad are two lifelong elder friends who enjoy spending time together, especially in their old age. They always talk about the economy, politics, and the awful situation of Zayandeh Rud and Isfahan's climate. These two have a tradition of joining together somewhere on the riverside and then visiting all the bridges **(by overpassing each at least once)** together. Aging takes a toll on the body, making it harder for people to walk long distances as easily as they once did. As a result, they decide to make this visit as short as possible.

They give you the length of the river, the location they joined on the riverside, the number of bridges, their lengths, and their locations on the river line. They want to know what is the **minimum distance to complete the visit**.

For simplicity, we assume that the distance between two consecutive bridges is the same on both sides of the river. Also, it is guaranteed that no two bridges share the same location. Notice that visiting a bridge means going from one side of the river to the other side by overpassing the bridge at least once.

Input

The first line contains three space-separated integers l ($l > 0$) — the length of the river, j ($0 \le j \le l \le 10^5$) — the location of Abbas Agha and Agha Javad, and n ($1 \le n \le 10^5$) — the number of bridges.

The second line contains n space-separated integers d_i ($1 \le d_i \le 10^5$) — the length of bridge i.

The third line contains n space-separated integers p_i ($0 \le p_i \le l$) — the location of bridge i.

Output

Print a single integer — the minimum distance they need to walk in order to visit all the bridges.

Samples

Sample input 1	Sample output 1
9 0 3 3 2 4 2 5 7	16

Sample input 2	Sample output 2
5 4 3 1 5 2 3 0 5	14