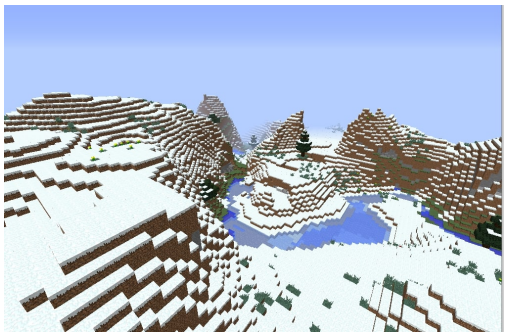
Up and Away Again

Problem ID: upandawayagain



Steve's Retreat

Another year has passed, and Steve wants to travel to his vacation house again! There are still n bases located on mountains located around his house. Steve is located at mountain 1 and his vacation house is at mountain x.

This year, the Biomes Ski Corporation has built many ski lifts between mountains. Steve wants to take the ski lifts hoping that he can get a more scenic trip than flying. Steve knows that each mountain has a danger level of d_i, meaning that a mountain with a height of h_i is only connected via ski lift with a mountain of height h_j if $abs(h_i - h_j) \leq d_j$. However, due to low budget, only ski lifts going downwards were built. Thus, from a mountain with height h_i, he can only travel to mountains with a danger level of d_j and height of h_j if $0 \leq h_i - h_j \leq d_j$.

Each ski lift operates with a time of t between two mountains. Please help Steve figure out the minimum time needed to travel to his vacation house, or determine that he can't reach his house using ski lifts!

Input

The first line contains 3 space-separated integers n, x, and t ($1 \leq n \leq 10^5, 1 \leq x \leq n, 1 \leq t \leq 10^9$), the number of bases, location of the vacation house, and time for each ski lift, respectively.

The second line contains n integers $h_1, h_2, \ldots, h_n$, where h_i ($1 \leq h_i \leq 10^5$) is the height of the i^{th} base's mountain.

The third line contains n integers $d_1, d_2, \ldots, d_n$, where d_i ($1 \leq d_i \leq 10^5$) is the danger level of the i^{th} base's mountain.

Output

Output a single integer that is the minimum time Steve needs to travel to his vacation house. Output -1 if he cannot reach his vacation house using ski lifts.

Sample Input 1	Sample Output 1
3 3 4 3 6 2 1 2 3	4