5 Dungeon 3

There is a dungeon with $N + 1$ floors. There are M players in the dungeon. The floors are numbered from 1 to $N + 1$, starting from the entrance. The players are numbered from 1 to M.

A player uses energy to move from a floor to the next floor. The amount of energy a player uses is A_i if he moves from the floor i ($1 \leq i \leq N$) to the floor $i + 1$. As this is a one-way dungeon, the only possible moves between floors are from the floor i to the floor $i + 1$ for some i ($1 \leq i \leq N$).

In each of the floors from the floor 1 to the floor N, inclusive, there is a fountain of recovery. At the fountain of recovery in the floor i ($1 \leq i \leq N$), a player can increase his energy by 1 paying B_i coins. A player can use a fountain multiple times as long as he has needed coins. However, each player has a maximum value of his energy, and his energy cannot exceed that value even if he uses a fountain of recovery.

Now the player j ($1 \leq j \leq M$) is in the floor S_j. His current energy is 0. His maximum value of energy is U_j. He wants to move to the floor T_j. His energy cannot be smaller than 0 along the way. How many coins does he need?

Write a program which, given the information of the dungeon and the players, determines whether it is possible for each player to move to the destination so that his energy does not become smaller than 0 along the way. If it is possible to move, the program should calculate the minimum number of coins he needs.

Input

Read the following data from the standard input. Given values are all integers.

$N\ M$
$A_1 \cdots A_N$
$B_1 \cdots B_N$
$S_1\ T_1\ U_1$
$\vdots$
$S_M\ T_M\ U_M$

Output

Write M lines to the standard output. The j-th line ($1 \leq j \leq M$) should contain the minimum number of coins the player j needs to move to the floor T_j. If it is impossible for the player j to move to the floor T_j, output -1 instead.

Constraints

- $1 \leq N \leq 200\,000$.
- $1 \leq M \leq 200\,000$.
- $1 \leq A_i \leq 200\,000$ $(1 \leq i \leq N)$.
- $1 \leq B_i \leq 200\,000$ $(1 \leq i \leq N)$.
- $1 \leq S_j < T_j \leq N + 1$ $(1 \leq j \leq M)$.
- $1 \leq U_j \leq 100\,000\,000$ $(1 \leq j \leq M)$.

Subtasks

1. (11 points) $N \leq 3\,000$, $M \leq 3\,000$.
2. (14 points) $U_1 = U_2 = \cdots = U_M$.
3. (31 points) $T_j = N + 1$ $(1 \leq j \leq M)$.
4. (44 points) No additional constraints.

Sample Input and Output

Sample Input 1	Sample Output 1
5 4 3 4 1 1 4 2 5 1 2 1 1 6 3 1 6 4 3 5 1 2 5 9	-1 29 3 22

Since the maximum value of energy of the player 1 is 3, the player 1 cannot move from the floor 2 to the floor 3. Hence the first line of output is −1.

On the other hand, the maximum value of energy of the player 2 is 4. The player 2 can move to the floor 6 by the following way.

- In the floor 1, he pays 8 coins, and his energy becomes 4. Then he moves to the floor 2, and his energy becomes 1.
- In the floor 2, he pays 15 coins, and his energy becomes 4. Then he moves to the floor 3, and his energy becomes 0.
- In the floor 3, he pays 4 coins, and his energy becomes 4. Then he moves to the floor 4, and his energy becomes 3.
- In the floor 4, he does not pay coins. Then he moves to the floor 5, and his energy becomes 2.
- In the floor 5, he pays 2 coins, and his energy becomes 4. Then he moves to the floor 6, and his energy becomes 0.

In total, the player 2 pays 29 coins. Since it is impossible for the player 2 to move to the floor 6 by paying less than 29 coins, the second line of output is 29.

Sample Input 2	Sample Output 2
10 10 1 8 9 8 1 5 7 10 6 6 10 10 2 8 10 3 9 8 3 7 2 11 28 5 11 28 7 11 28 1 11 18 3 11 18 8 11 18 4 11 11 6 11 11 10 11 11 9 11 5	208 112 179 248 158 116 234 162 42 -1

This sample input satisfies the constraints of the subtask 3.

Sample Input 3	Sample Output 3
20 20 2 3 2 11 4 6 9 15 17 14 8 17 3 12 20 4 19 8 4 5 19 3 18 2 13 7 5 19 10 1 12 8 1 15 20 1 13 2 18 6 12 15 67 7 15 18 16 17 14 9 21 97 1 19 43 3 18 31 16 20 70 7 20 28 1 16 61 3 5 69 9 10 15 2 13 134 11 19 23 16 20 14 5 21 16 15 20 11 7 11 54 7 16 16 13 17 10 3 15 135	151 591 4 284 339 517 35 581 254 58 -1 178 519 -1 -1 -1 219 -1 -1 214