

IOI Training Camp 2013 – Final 3

3 Mac vs PC

You run a roadside desktop publishing shop in which you have a Mac and a PC. You have a sequence of N customers to service. Each customer's job takes one day and you can execute the job either on the Mac or on the PC. The amount you charge customer i is the same whether you use a Mac or a PC, but you incur a operating cost of M_i if the job is run on the Mac and P_i if the job is run on the PC. Your aim is to choose either a Mac or a PC on each day so that your overall operating cost is minimized. However, your computers are old and unreliable, so you cannot run the same machine for more than K days in a row.

For instance, suppose you have 5 customers and the operating cost of the Mac and PC for the next 5 days are $[1, 1, 1, 7, 9]$ and $[4, 3, 5, 6, 2]$, respectively. Further, suppose that $K = 2$. Then, the minimum operating cost you can achieve is 13, by using the Mac on days 1 and 3 and the PC on days 2,4 and 5.

Input format

- The first line of input consists of two space separated integers, N and K .
- The second line of input consists of N space separated integers denoting the operating cost of the Mac for each of the N days.
- The third line of input consists of N space separated integers denoting the operating cost of the PC for each of the N days.

Output format

A single integer, the minimum total operating cost.

Test Data

In all testcases, the daily operating cost for both Mac and PC is bounded by 2×10^5 .

- Subtask 1 (15 marks) : $N \leq 20$, $K \leq 10$.
- Subtask 2 (20 marks) : $N \leq 1000$, $K \leq 10$.
- Subtask 3 (20 marks) : $N \leq 10000$, $K \leq 100$.
- Subtask 4 (45 marks) : $N \leq 300000$, $K \leq 10000$.

Sample Input

```
5 2
1 1 1 7 9
4 3 5 6 2
```

Sample output

```
13
```

Limits

- *Time limit:* 4 s
- *Memory limit:* 128 MB