2   4-Russians

Time Limit: 1.0s
Memory Limit: 512MB

2.1   Problem Description

Ryan the Smurf and Benson the Rabbit are in the middle of an all-out war with Chien Hao's cats! Xing Yang the snake and Jamie the Hedgehog build a wall to defend Bunnyland. The wall consists of N bunkers numbered from 1 to N with the ith bunker having S_i smurfs inside and C_i cats right outside the bunker. Fortunately, the well-trained smurfs win the battle, for now.

Chien Hao has developed a new weapon, known as the 4-RUSSIANS! Each 4-RUSSIANS missile can destroy a single contiguous segment of bunkers, and hurts both smurfs and cats. Chien Hao wants to maximise the smurfs destroyed while minimising the pain of his cats.

For every bunker destroyed, the total effectiveness of the attack increases by S_i as those smurfs are blown up. However, for every pair of adjacent bunkers in which only 1 of them is destroyed, the cats in the destroyed bunker get extremely jealous of the surviving cats, increasing their pain and decreasing the effectiveness of the attack by the product of the number of cats in the unaffected bunker and the number of cats in the bunker hit by the 4-RUSSIANS missile. Formally, when a 4-RUSSIANS missile destroys a contiguous segment $[l, r]$, its effectiveness $E_{l,r}$ is as follows:

$$E_{l,r} = (\sum_{i=l}^{r} S_i) - C_{l-1}C_l - C_r C_{r+1}$$

Note that Chien Hao considers $C_0 = C_{N+1} = 0$ since there are no cats there.

Chien Hao may choose to attack as many **non-overlapping** contiguous segments as he wishes (possibly zero), as long as the total number of bunkers affected is $\leq K$. What is the maximum effectiveness that Chien Hao can achieve? (The total number of bunkers affected is equals to the sum of all $(r - l + 1)$ of all chosen segments.)

2.2   Input Format

The input format is as follows:

- The first line of input will contain 2 integers, N and K respectively.

- The next line of input will contain N spaced integers, the ith one representing C_i.

- The next line of input will contain N spaced integers, the ith one representing S_i.

2.3 Output Format

The output format is as follows:

- Output a single integer, the maximum effectiveness that Chien Hao can achieve.

- Note: Chien Hao can choose 0 segments too, if that's what maximises the effectiveness..

2.4 Subtasks

For all testcases, it is guaranteed that:

- $1 \leq K \leq N \leq 5000$

- $0 \leq C_i, S_i \leq 10^6$

Subtask	Score	N	Additional constraints
1	2	-	$K = N$
2	9	-	$K = 1$
3	11	-	$C_i = 0$
4	21	$N \leq 20$	-
5	38	$N \leq 400$	-
6	19	-	
7	0	Sample Testcases	

2.5 Sample Testcases

standard input	standard output
3 1 1 1 1 1 1 1	0
3 2 1 1 1 10 1 1	10
5 2 1 9 9 9 2 20 20 20 20 20	13

2.6 Sample Testcases Explanation

In the first sample case, Chien Hao can bomb the 1st bunker, destroying 1 smurf and having 1 in decreased effectiveness.

In the second sample case, Chien Hao can bomb the 1st and 2nd bunkers, destroying 11 smurfs and having 1 in decreased effectiveness.

In the last sample case, Chien Hao can bomb the 1st and 5th bunkers, destroying 40 smurfs and having $9 + 18 = 27$ in decreased effectiveness.