Purchasing Police Badges

Input file:	`standard input`
Output file:	`standard output`
Time limit:	1 second
Memory limit:	256 megabytes

The police commissioner must purchase police badges for his team of officers. Their trip can be modeled as a movement in the positive x-direction starting at $X = 0$. Along the positive x-axis, there are N stores, labeled 1 through N, positioned at P_i selling B_i of these badges for A_i dollars each. At K points X_i along the way, a cyber criminal appears forcing the commissioner to pay R dollars for each badge that has already been bought. Given that the commissioner must purchase M badges, stopping the second he finishes his purchases, what is the minimum cost required to obtain all the necessary badges?

Input

Line 1: N, M, K, R
Line 2 .. N+1: A_i, B_i, P_i
Lines N+2 .. N+K+1: X_i

Output

Line 1: Minimum cost to purchase M badges - guaranteed to fit into a 32-bit signed integer

Example

standard input	standard output
2 5 3 2 2 9 2 3 8 1 2 1 4	20

Note

$1 \leq N, M, K \leq 1,000$
$1 \leq R \leq 100$
$0 \leq A_i, B_i \leq 1,000$
$0 \leq X_i, P_i \leq 100,000$
If the criminal and the commissioner are at the same spot, the commissioner must pay the criminal before buying any badges.