eggman

Barr the Bear has decided to be an eggman! What an eggman does is... collect eggs. To do so, Barr has entered the Land of the Eggs! In this mystical land, N eggs numbered $0..N-1$ fall magically from the sky. Barr the Bear will run around trying to catch the eggs.

The Land of the Eggs can be modelled as a 2D plane, where Barr can only move along the x-axis. At time 0, egg i appears at a **distinct** point (X_i, Y_i) with $Y_i > 0$, and falls vertically downwards at a speed of 1. Barr can position himself at any x at time 0, and can move left or right at a speed of 1. He can collect egg i if the egg hits the x-axis at time t, and he is at $(X_i, 0)$ at time t.

Barr the Bear moves slowly, but luckily, he has a teleporter that he can use **at most once**. At any time t, Barr is able to teleport to any x in negligible time. However, this teleporter is expensive! If he is at position x_0 and wants to teleport to x, he will have to pay a cost of $K|x - x_0|$ dollars.

Collecting egg i will generate a revenue of V_i dollars. Barr would like to maximize his total profit: the total revenue from eggs collected minus the teleporter cost if used. Can you help him?

Implementation

You should submit a file that implements the following procedure:

```
long long eggman(int N, int K, int X[], int Y[], int V[])
```

It should return the maximum total profit.

Your procedure: eggman

```
long long eggman(int N, int K, int X[], int Y[], int V[])
```

Description

You will need to implement this function.

It should return the maximum total profit.

Parameters

- `int N` - The number of eggs
- `int K` - The teleporter cost constant

- `int X[]` - A zero-indexed array. `X[i]` is the initial x-coordinate of egg i
- `int Y[]` - A zero-indexed array. `Y[i]` is the initial y-coordinate of egg i
- `int V[]` - A zero-indexed array. `V[i]` is the profit generated from egg i

Return value

Return the maximum total profit.

Subtasks

For all subtasks, $0 \leq K \leq 10^8$, $1 \leq X_i, Y_i, V_i \leq 10^8$ and $1 \leq N \leq 100000$. All (X_i, Y_i) are distinct.

Subtask 1 (19 points)

$1 \leq N \leq 1000$.

Subtask 2 (11 points)

$K = 10^8$. $V_i = 1$ for all i.

Subtask 3 (15 points)

$K = 10^8$. $V_i \leq 500$ for all i.

Subtask 4 (23 points)

$K = 0$.

Subtask 5 (32 points)

No additional restrictions.

Sample Input and Output

Input	Output
4 5 3 5 10 2 4 20 7 5 30 9 7 40	80

For this sample, $K = 5$ and there are 4 eggs initially at positions $(3, 5)$, $(2, 4)$, $(7, 5)$ and $(8, 6)$. One way of earning 80 dollars is:

1. Start at $x = -1$.
2. Move to $x = 2$ and wait. Collect egg 1 for 20 dollars at time $t = 4$.
3. Move to $x = 3$. Collect egg 0 for 10 dollars at time $t = 5$.
4. Teleport to $x = 7$ for a cost of $5 \times |7 - 3| = 20$ dollars. Collect egg 2 for 30 dollars at time $t = 5$.
5. Move to $x = 9$. Collect egg 3 for 40 dollars at time $t = 7$.

The profit will be $10 + 20 + 30 + 40 - 5 \times |7 - 3| = 80$ dollars.