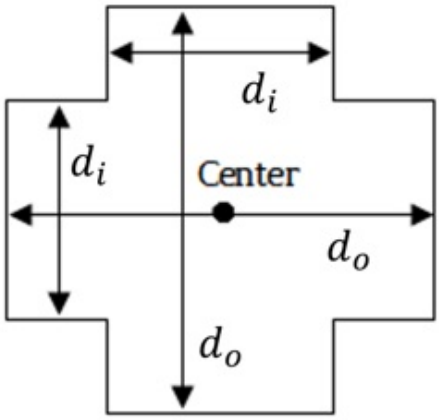
3-1. Crosses on the Grid

A *cross* with inner diameter d_i and outer diameter d_o ($d_i < d_o$) is defined as a rectilinear shape on a plane like the picture below:



Note that every cross can be obtained by removing four congruent squares from the four corners of a larger square.

Given N crosses, you are to choose exactly K of them to put on a 2D plane. The center of each chosen cross should be at the same point, and all segments of each chosen cross should be parallel to the coordinate axes. What is the maximum possible area of the intersection you can make?

Implementation details

You should implement the following function. It will be called by the grader once for each test case.

```
int64 SelectCross (int K, int[] I, int[] O)
```

- K: the number of crosses you should choose. $1 \leq K \leq N$ holds.
- I, O: arrays of length N. Cross i ($0 \leq i \leq N-1$) is a cross with inner diameter $I[i]$ and outer diameter $O[i]$.
- This procedure should return the maximum possible area of the intersection of K crosses over all possible choices.

Constraints

- $2 \leq N \leq 200\,000$
- $1 \leq K \leq N$
- $1 \leq I[i] < O[i] \leq 1\,000\,000\,000$ (for all $0 \leq i \leq N-1$)

Subtasks

1. (8 points) $K = 1$
2. (55 points) $K \leq 20$
3. (37 points) No additional constraints.

Example

Consider the following call.

```
SelectCross(3, [1, 2, 1, 1, 2], [2, 4, 3, 4, 3])
```

The correct answer is 5.

Sample grader

You can download the sample grader package on the same page you downloaded the problem statement. (scroll down if you don't see the attachment)

If you use IDEs like Visual Studio, Eclipse or Code:Blocks, then import `cross.cpp`, `cross.h` and `grader.cpp` into one project and you will be able to compile all these files at once.

If you want to compile by yourself, refer to the compilation commands in the statement page.

You should submit only `cross.cpp`.

Input format

- line 1: N K
- line 2: $I[0]$ $I[1]$ $\cdots$ $I[N-1]$
- line 2: $O[0]$ $O[1]$ $\cdots$ $O[N-1]$

Output format

The sample grader prints a single line containing the return value of `SelectCross`.