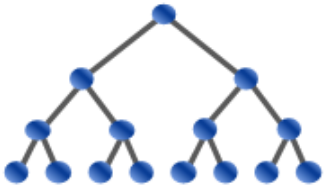

USACO 2022 February Contest, Gold
Problem 3. Moo Network

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Contest has ended.

Log in to allow submissions in analysis mode

English (en)

Farmer John's N cows ($1 \leq N \leq 10^5$) are spread far apart on his farm and would like to build a communication network so they can more easily exchange electronic text messages (all of which of course contain variations of "moo").

The ith cow is located at a distinct location (x_i, y_i) where $0 \leq x_i \leq 10^6$ and $0 \leq y_i \leq 10$. The cost of building a communication link between cows i and j is the squared distance between them: $(x_i - x_j)^2 + (y_i - y_j)^2$.

Please calculate the minimum cost required to build a communication network across which all the cows can communicate. Two cows can communicate if they are directly connected by a link, or if there is a sequence of links along which their message can travel.

****Note: the time limit for this problem is 4s, twice the default.****

INPUT FORMAT (input arrives from the terminal / stdin):

The first line of input contains N, and the next N lines each describe the x and y coordinates of a cow, all integers.

OUTPUT FORMAT (print output to the terminal / stdout):

Please output the minimum cost of a network that will allow all cows to communicate. Note that this cost might be too large to fit into a 32-bit integer and may require use of 64-bit integers (e.g., "long long" integers in C++).

SAMPLE INPUT:

```
10
83 10
77 2
93 4
86 6
49 1
62 7
90 3
63 4
40 10
72 0
```

SAMPLE OUTPUT:

```
660
```

SCORING:

- Test cases 2-3 satisfy $N \leq 1000$.
- Test cases 4-15 satisfy no additional constraints.

Problem credits: Brian Dean

Contest has ended. No further submissions allowed.