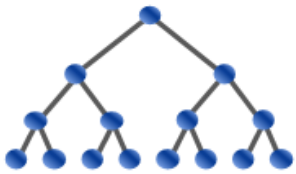

USACO 2014 DECEMBER CONTEST, BRONZE
PROBLEM 1. MARATHON

Problem 1: Marathon [Nick Wu, 2014]

Unhappy with the poor health of his cows, Farmer John enrolls them in an assortment of different physical fitness activities. His prize cow Bessie is enrolled in a running class, where she is eventually expected to run a marathon through the downtown area of the city near Farmer John's farm!

The marathon course consists of N checkpoints (3 <= N <= 100,000) to be visited in sequence, where checkpoint 1 is the starting location and checkpoint N is the finish. Bessie is supposed to visit all of these checkpoints one by one, but being the lazy cow she is, she decides that she will skip up to one checkpoint in order to shorten her total journey. She cannot skip checkpoints 1 or N, however, since that would be too noticeable.

Please help Bessie find the minimum distance that she has to run if she can skip up to one checkpoint.

Note that since the course is set in a downtown area with a grid of streets, the distance between two checkpoints at locations (x1, y1) and (x2, y2) is given by |x1-x2| + |y1-y2|. This way of measuring distance -- by the difference in x plus the difference in y -- is sometimes known as "Manhattan" distance because it reflects the fact that in a downtown grid, you can travel parallel to the x or y axes, but you cannot travel along a direct line "as the crow flies".

INPUT: (file marathon.in)

The first line gives the value of N.

The next N lines each contain two space-separated integers, x and y, representing a checkpoint (-1000 <= x <= 1000, -1000 <= y <= 1000). The checkpoints are given in the order that they must be visited. Note that the course might cross over itself several times, with several checkpoints occurring at the same physical location. When Bessie skips such a checkpoint, she only skips one instance of the checkpoint -- she does not skip every checkpoint occurring at the same location.

SAMPLE INPUT:

```
4
0 0
8 3
11 -1
10 0
```

OUTPUT: (file marathon.out)

Output the minimum distance that Bessie can run by skipping up to one checkpoint. Don't forget to end your output with a newline. In the sample case shown here, skipping the checkpoint at (8, 3) leads to the

minimum total distance of 14.

SAMPLE OUTPUT:

14

Language: C ▼

Source File: Choose File No file chosen

Submit Solution

Note: Many issues (e.g., uninitialized variables, out-of-bounds memory access) can cause a program to product different output when run multiple times; if your program behaves in a manner inconsistent with the official contest results, you should probably look for one of these issues. Timing can also differ slightly from run to run, so it is possible for a program timing out in the official results to occasionally run just under the time limit in analysis mode, and vice versa. Note also that we have recently changed grading servers, and since our new servers run at different speeds from the servers used during older contests, timing results for older contest problems may be slightly off until we manage to re-calibrate everything properly.