Interactives (Beta)

April Camp 2022

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Cloyster: Statement

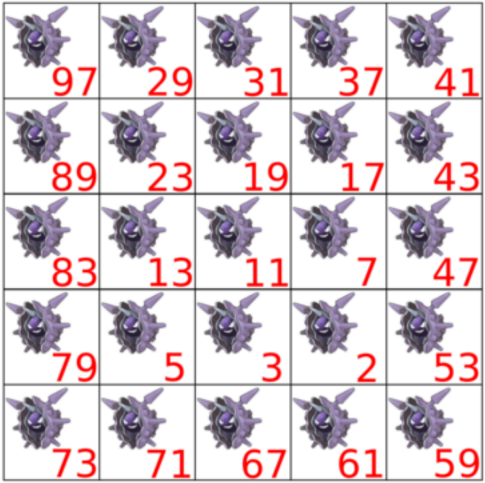
There is an $N \times N$ grid of numbers, where each number is unique. Additionally, for all grid cells except the largest you are guaranteed that at least one of its neighbouring cells has a larger value. By neighbour I mean one of the (up to) 8 surrounding cells, including diagonals.

You can query the value at a cell (i, j). You can perform up to $3N + 210$ queries, and must find the cell with the maximum value.

$1 \leq N \leq 2000$.

Source

Cloyster: Sample



The Hidden Pair: Statement

You are given a tree with N nodes. Two distinct nodes a and b have been chosen, however you do not know what they are. You wish to find a and b.

To do this you can perform the following query: you give a list of nodes, and you get told a node from your list whose sum of distances to both the hidden nodes is minimal (if there are multiple such nodes in the list, you will receive any one of them). You will also get the sum of distances of that node to the hidden nodes.

$1 \leq N \leq 1000$.

You can ask up to 11 queries.

Source

Vabank: Statement

You are a manager at a bank, and in one click are able to steal any amount of money. However, the bank has a tolerance M, such that if more than M dollars is stolen you will get caught, and if at most M dollars are stolen you can keep the money. If you get caught stealing X dollars, where $X > M$, you must pay back the X dollars and also pay an additional X dollars as a fine. If you can't pay the fine, you will be taken to the police.

You don't know the tolerance M, but wish to find it. You start with 1 dollar and can perform queries by stealing any amount of money. You need to find M is a few queries as possible, without being taken to the police.

$0 \leq M \leq 10^{14}$ and you may use up to 150 queries.

Source