Rebuild blockchain
Problem ID: eveblockchain

Blockchains are used more and more in the world, with their most popular uses being Cryptocurrencies and Smart Contracts.

Eve was in charge of keeping a blockchain in order but there has been a failure in the system and now the blocks are all shuffled!

For the purpose of this problem, a blockchain is, as the name suggests, a chain of blocks, where a block has a unique identifier attached to it (called a "hash").

A block stores, among other things, its own hash and the hash of its predecessor (i.e., the block that comes immediately before it in the chain). The first block of the chain, also called the "genesis block" doesn't have a predecessor.

For each block, you know its hash and its predecessor's hash. Can you help Eve recover the original order of the blocks?

For example, if you know that the existing blocks are $(1F, 4A2)$, $(4A2, NULL)$, and $(1AC2F9, 1F)$ (where a block (a, b) means that its own hash is a and the hash of its predecessor is b), then the correct order has to be $42A, 1F, 1AC2F9$, because the predecessor of $1F$ is $42A$, and the predecessor of $1AC2F9$ is $1F$.

Input

The input starts with a line containing a single integer N ($1 \leq N \leq 10^5$).

The following N lines contain 2 words each, the node's own hash, and its predecessor's hash. The lines are given in random order.

Each of the two words is either NULL (indicating the genesis block, which doesn't have a predecessor) or a sequence of at least 1 and up to 40 characters, each one being a digit or a letter between "A" and "F".

It is guaranteed that no two blocks have the same hashes and that it is possible to recover the original order of the blockchain.

Output

The output should contain N lines with the hashes of the blocks in their correct order (starting from the genesis block).

Sample Input 1

```
3
1F 4A2
4A2 NULL
1AC2F9 1F
```

Sample Output 1

```
4A2
1F
1AC2F9
```

Sample Input 2

```
5
2 1
5 4
3 2
1 NULL
4 3
```

Sample Output 2

```
1
2
3
4
5
```