Travelling Points

Problem Statement

You are given a 2-D grid and N points on the grid. You can move in all four directions: North, South, East and West from a given point. You are required to travel each of the points starting from any of them such that the total distance travelled for the whole journey is minimised. But there are M restrictions, each of the form (u, v), meaning that you can't visit point "v" after point "u". There can also be cases where is it not possible to travel all the points due to the restrictions. In such a case, print the answer as "-1".

Constraints

2 <= N <= 20
0 <= M <= N * (N - 1)
1 <= x, y <= 100000
1 <= u, v <= N
u != v
All pairs of (u, v) are distint.

Input Format

The first line contains a single integer **N**. Each of the next **N** lines contain 2 integers each, (**x, y**), denoting the point coordinates. The next line contains a single integer **M**. Each of the next **M** lines contains 2 integers each, **(u, v)**, denoting the restrictions as described in the problem statement.

Input Sample 1

5
1 1
2 2
3 3
4 4
5 5
2
1 2
4 3

Output Sample 1

10
Explanation 1:

10
Explanation 1:
The only 2 possible ways are:
(2,2) -> (1,1) -> (3,3) -> (4,4) -> (5,5)
(4,4) -> (5,5) -> (3,3) -> (2,2) -> (1,1)

Input Sample 2
3
2 3
4 6
2 6
0

Output Sample 2
5
Explanation 2:
The only 2 possible ways are:
(2,3) -> (2,6) -> (4,6)
(4,6) -> (2,6) -> (2,3)

Input Sample 3
4
3 4
2 5
10 43
9 73
6
1 2
2 1
3 1
4 1
1 4
1 3

Output Sample 3
-1

Input Sample 3

4
3 4
2 5
10 43
9 73
6
1 2
2 1
3 1
4 1
1 4
1 3

Output Sample 3

-1

YOUR ANSWER

We recommend you take a quick tour of our editor before you proceed. The timer will pause up to 90 seconds for the tour. Start tour

For help on how to read input and write output in Python 3, click here.

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Original code | Python 3

What A Shape.

Ravi was solving an assignment in class. The assignment was to construct a binary tree given its in-order and post-order traversals. Bored of doing this for the entire day he started to notice that the tree shapes resembled punctuation marks. So he decided to associate a shape to every tree he constructed. Help Ravi write a program where, given the in-order and post-order traversals of a binary tree, he can print the punctuation mark that resembles the shape of the tree. The shape of the tree can be one of the following:

/(forward slash) : if every node in the tree(except the leaf node) has only left child

\(backward slash) : if every node in the tree(except the leaf node) has only right child

<(less than symbol) : up till the mid node (node c in case below) every node has only left child and after mid node every node has only right child

```
      a
    b
  c
    d
      e
```

NOTE : number of nodes above and below node c need to be the same

Below tree doesn't qualify for the above shape

```
      a
  b
    c
      d
```

>(greater than symbol) : up till the mid node (node c in case below) every node has only right child and after mid node every node has only left child

```
  a
    b
      c
    d
  e
```

NOTE : number of nodes above and below node c need to be the same

Below tree doesn't qualify for the above shape

NOTE : number of nodes above and below node c need to be the same

Below tree doesn't qualify for the above shape

```
        a
            b
        c
    d
```

^(caret or exponent symbol) : left child nodes except leaf node only have left children and right child nodes except leaf node only have right children

```
            a
        b       c
    d               e
```

NOTE : number of nodes left and right of node a need to be the same

Below tree doesn't qualify for the above shape

```
        a
    b       c
                d
```

#(hash symbol) : if the tree does not resemble any of the above shapes

INPUT/OUTPUT FORMAT and CONSTRAINTS :

INPUT
n
i_1
p_1
i_2
p_2
....
....
i_n
p_n

OUTPUT
o_1
o_2
....
....
o_n

n is the number of trees, where **(0 < n < 10^7)**. **i_n** and **p_n** are the **in-order** and **post-order** traversals of tree n respectively, where, **(0 < Length of (i,p) < 63).**
Each node of a particular tree consists of only one of the characters mentioned below and two nodes of the same tree can **NOT** have the same value.
characters = [abcdefghijklmnopqrstuvwxyzABCDEFGHIJKLMNOPQRSTUVWXYZ0123456789]
o_n is the punctuation mark that resembles the shape of tree n.

SAMPLE CASES :

INPUT
1
dbace
dbeca

OUTPUT
^

(Explanation : tree shape is shown :

```
        a
    b     c
d           e
```

INPUT
1
bacd
bdca

OUTPUT
#

(Explanation : tree shape is shown :

```
        a
      b   c
    d       e
```

INPUT

1
bacd
bdca

OUTPUT

#

(Explanation : tree shape is shown :

```
      a
   b     c
           d
```

YOUR ANSWER

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For help on how to read input and write output in C, click here.