Naomi and the Gemini Bots
Problem ID: naomigeminibots

Naomi, the roboticist, is testing her latest invention - the Gemini Bots. The testing ground is a 1000x1000 grid with walls on all four sides. The lower-left corner has the coordinates $(0, 0)$, and the upper-right corner has the coordinates $(999, 999)$.

The Gemini Bots, as the name suggests, consist of two robots connected through the Gemini System. The first robot starts at (x_1, y_1) and needs to go to (x_2, y_2). The second robot starts at (x_3, y_3) and needs to go to (x_4, y_4). In each step, Naomi can send one of four commands: up, right, down, and left. The first robot will move exactly one cell in the direction of the command. So a "right" command increases the first coordinate by one, and "left" decreases it by one. "up" increases the second coordinate by one, and "down" decreases it by one. However, the second robot in the system will move in the direction rotated 90 degrees clockwise, i.e., right for up, down for right, left for down, and up for left. As an additional restriction, if a move would cause a robot to move outside of the testing ground, it will stay in place instead. The two robots may occupy the same cell and won't interfere with each other's movement.

Help Naomi conduct the test by finding a sequence of commands that would move the Gemini Robots from the starting locations to the target locations, if there is one.

Input

The single line contains 8 space-separated integers, $1 \leq x_1, y_1, x_2, y_2, x_3, y_3, x_4, y_4 \leq 999$, the initial and target coordinates of the first bot and the initial and target coordinates of the second bot. It is guaranteed that at least one robot's initial coordinates are different from its target coordinates.

Output

If no sequence of commands can make both bots reach the target coordinates, print a single line containing the string "IMPOSSIBLE" (without quotes).

Otherwise, the output should contain a single string, no longer than 20000 characters, only consisting of "URDL", which corresponds to Up, Right, Down, Left, respectively, describing a sequence of the commands.

Any sequence of commands that move the robots from the initial positions to the target positions will be judged as correct. Your output doesn't have to be the shortest of such sequences.

Sample Input 1	Sample Output 1
0 0 0 1 0 0 1 0	U

Sample Input 2	Sample Output 2
0 0 1 1 2 2 1 1	DDUR

Sample Input 3	Sample Output 3
0 0 1 1 2 2 1 1	DDRUUD