



Magical Stones II

Time limit: 1000 ms
Memory limit: 256 MB

You are practicing your alchemy skill over a pile of magical stones. A magical stone has N possible states numbered from 1 to N . In the beginning, you have exactly one magical stone that is in each state i .

You know two magic spells: the *white* spell, and the *black* spell. When you cast the white spell, a stone that is in state i will transform into a stone in state W_i . When you cast the black spell, a stone that is in state i will transform to a stone in state B_i . Whenever two stones are in a same state i , they will purify each other, and combine into a single more powerful stone in state i . Multiple stones in a same state will combine at the same time.

You would like to obtain one single magical stone that is the purest and the most powerful of all. You will cast a sequence and black and white spells and combine all the N stones you have into one. The final stone can be in any state. Is this ever possible?

Standard input

The input has a single integer T on the first line, the number of test cases.

Each test case has single integer N on the first line. The next two lines each have N integers. The first line gives W_1, \dots, W_N . The second line gives B_1, \dots, B_N .

Standard output

Output one line for each test case.

If it is possible to combine all the N stones into one, output a string that is the sequence of magic spells you will cast. Output `W` for a white spell and `B` for a black spell. If there are multiple possible sequences, you may output any of them. You do not need to find a shortest sequence of spells. However since you don't want to spend the whole 24 hours casting spells, you must output a sequence of no more than 10^6 spells.

If it is impossible to combine all the stones into one, output a single word `impossible`.

Constraints and notes

- $1 \leq T \leq 30$
 - $2 \leq N \leq 100$
 - $1 \leq W_i, B_i \leq N$. It is possible that $W_i = i$ or $B_i = i$.
 - It can be shown that if it is possible to combine all stones into one, then there exists a sequence of no more than 10^6 magic spells to do so.
 - Your answer is considered correct as long as you have a single stone at the end of the spell sequence. That is, it is allowed to cast redundant spells after successfully combining the stones into one.
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- For 25% of the test data, $N \leq 20$

Input	Output	Explanation
3 4 2 3 4 1 3 3 2 3 5 1 2 3 4 5 2 3 4 5 5 4 2 2 3 4 1 4 1 2 1	BWB BBBWBW impossible	Case 1: The states the stones are in after each spell are: <ul style="list-style-type: none">At the beginning: $\{1, 2, 3, 4\}$After a black spell: $\{2, 3\}$After a white spell: $\{3, 4\}$After a white spell: $\{1, 4\}$After a black spell: $\{3\}$ Case 2: After four black spells you will obtain a single stone in state 5. It is okay that you cast some redundant spells after that, as long as the total number of spells does not go above 10^6 . Case 3: The white spell does not allow you to combine any stones. Using only black spells will be able to combine the stones that are initially in states 1, 3 and initially in states 2, 4, but not all the states.