Tree Equation

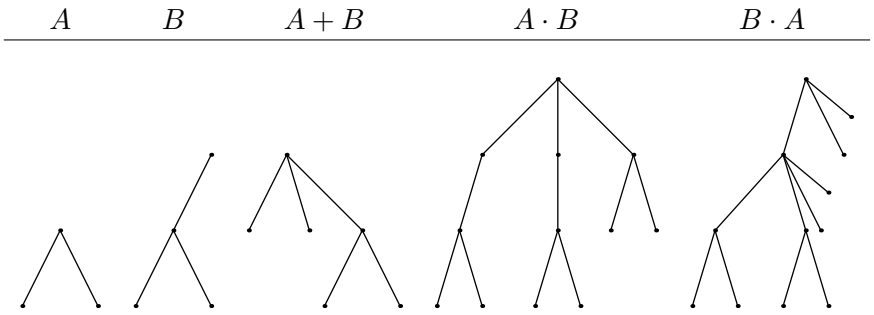
Input file:	`standard input`
Output file:	`standard output`
Time limit:	1 second
Memory limit:	256 megabytes

Tired of solving mathematical equations, DreamGrid starts to solve equations related to rooted trees.

Let A and B be two two arbitrary rooted trees and $r(T)$ denotes the root of T. DreamGrid has defined two basic operations:

- **Addition.** $T = A + B$ is built by merging the two roots $r(A)$, $r(B)$ into a new root $r(T)$. That is the subtrees of A and B (if any) become the subtrees of $r(T)$.
- **Multiplication.** $T = A \cdot B$ is built by merging $r(B)$ with each vertex $x \in A$ so that all the subtrees of $r(B)$ become new subtrees of x.

The following picture may help you understand the operations.



Given three rooted trees A, B and C, DreamGrid would like to find two rooted trees X and Y such that $A \cdot X + B \cdot Y = C$.

Input

There are multiple test cases. The first line of input contains an integer T, indicating the number of test cases. For each test case:

The first line contains three integers n_a, n_b and n_c ($2 \le n_a, n_b \le n_c \le 10^5$) – the number of vertices in rooted tree A, B and C, respectively.

The second line contains n_a integers $a_1, a_2, \ldots, a_{n_a}$ ($0 \le a_i < i$) – where a_i is the parent of the i-th vertex in tree A.

The third line contains n_b integers $b_1, b_2, \ldots, b_{n_b}$ ($0 \le b_i < i$) – where b_i is the parent of the i-th vertex in tree B.

The fourth line contains n_c integers $c_1, c_2, \ldots, c_{n_c}$ ($0 \le c_i < i$) – where c_i is the parent of the i-th vertex in tree C.

Note that if $a_i = 0$ ($b_i = 0$ or $c_i = 0$), then the i-th vertex is the root of the tree A (B or C).

It is guaranteed that the sum of all n_c does not exceed 2×10^6.

Output

For each test case, if you can not find a solution, output "Impossible" (without quotes) in the first line.

Otherwise, output two integers n_x and n_y ($1 \le n_x, n_y \le 10^5$) denoting the number of vertices in rooted tree X and Y in the first line.

Then in the second line, output n_x integers $x_1, x_2, \ldots, x_{n_x}$ $(0 \leq x_i < i)$ – where x_i is the parent of the i-th vertex in tree X.

Then in the third line, output n_y integers $y_1, y_2, \ldots, y_{n_y}$ $(0 \leq y_i < i)$ – where y_i is the parent of the i-th vertex in tree Y.

If there are multiple solutions, print any of them.

Examples

standard input	standard output
2 2 3 10 0 1 0 1 2 0 1 1 3 4 3 6 3 1 9 4 3 10 0 1 2 2 0 1 2 0 1 1 3 4 3 6 3 1 9	Impossible 2 1 0 1 0
1 5 5 49 0 1 1 3 1 0 1 2 1 2 0 1 2 3 4 1 6 7 8 9 1 11 12 13 14 11 16 17 18 19 1 21 22 23 24 1 26 26 1 1 30 31 31 30 30 35 36 36 35 30 40 41 41 40 1 45 46 46 45	5 5 0 1 2 3 4 0 1 1 3 3