



Paperchase

Mouse Martin and Mouse Fabian are preparing a paperchase taking place in the campus of EPF Lausanne. Since they don't have a lot of time until the paperchase starts, they prepare their parts independently.

Mouse Martin prepares a post at building a , where the group has to solve a riddle and then has to go to the next hint at building b .

Mouse Fabian prepares his post at building c and with a hint leading to building d .

The campus of EPF Lausanne has the special property that for any two buildings there is exactly one path (in other words, the graph forms a tree).

Now, it would be really bad if two groups, one moving from a to b and one moving from c to d could possibly meet, because they could spoil the solutions. You can assume both groups always take the shortest path.

Input

The first line contains three integers, n, a, b, c, d . n is the number of buildings, and a, b, c and d are the locations of the posts mentioned in the descriptions.

The following $n - 1$ lines contain two numbers uv , meaning there is an edge between u and v .

Output

If the paths of the two groups intersect, print "bad preparation", otherwise print "good job".

Limits

There are 4 test groups, each of which is worth 25 points. In all test cases $1 \leq n, a, b, c, d$ are pairwise distinct. $0 \leq a, b, c, d, x, y < n$.

- In test group 1, we have $N \leq 10$.
- In test group 2, we have $N \leq 100$
- In test group 3, we have $N \leq 50\,000$
- In test group 4, we have $N \leq 200\,000$

Examples

Input	Output
4 0 3 1 2 0 1 1 2 2 3	bad preparation



Swiss Olympiad in Informatics

Workshop 2019

Task *paperchase*

Input	Output
5 3 2 0 1 0 4 4 1 1 3 3 2	good job