

Wooden Checker

Input file: *standard input*
 Output file: *standard output*
 Time limit: 2 seconds
 Memory limit: 1024 mebibytes

This is an interactive problem.

Vlad has an empty directed graph with n vertices labeled by integers from 1 to n . He plans to add $n - 1$ edges to this graph one by one, ensuring that at every moment two conditions are met:

1. The graph is a directed forest: each connected component is in the form of a directed rooted tree, where the edges are directed from the root to the leaves.
2. For each vertex of the graph, the set of vertices reachable from this vertex is a segment of integers without gaps.

Your task is to check these two conditions after adding each edge.

Interaction Protocol

First, the jury program will provide a string with an integer n ($1 \leq n \leq 2 \cdot 10^5$), the number of vertices. Then, there will be $n - 1$ edge additions. For each addition, the jury will input a string with the vertex numbers v and u ($1 \leq v, u \leq n; v \neq u$). Check whether Vlad's conditions are met after adding the edge $v \rightarrow u$, and output the answer on a separate line in the following format.

- If the first condition is not met, output the string "Bad oriented forest".
- If the second condition is not met, output the string "Bad segment at v ", where v is the number of any vertex for which the condition is not met.
- If both conditions are not met, output any of the two messages described above.
- Otherwise, if both conditions are met, output the string "Good".

If any condition is not met, your program should terminate immediately after outputting the message about it, even if it processed less than $n - 1$ edges.

No directed edge $v \rightarrow u$ is added twice. All $n - 1$ edge additions are fixed in advance.

Example

<i>standard input</i>	<i>standard output</i>	Notes
6		
1 2	Good	
3 4	Good	
3 1	Good	
5 6	Good	
5 1	Bad segment at 5	