Problem B. Bag of Bags

Input file:	*standard input*
Output file:	*standard output*
Time limit:	2 seconds
Memory limit:	256 mebibytes

A mathematician goes to the shop every day and brings a bag from it. The bags are nice and practical, so mathematician wants to keep them for future usage. He also wants to keep his bags in order: big bags with big bags and small bags with small bags.

The bag brought on the i-th day (we'll just call it bag i) occupies volume a_i in folded state and volume b_i in unfolded state (naturally, $a_i < b_i$). The bag i fits into the bag j if $a_i < b_j$. Mathematician thinks that bags i and j are *equal* (and should be kept together) if the bag i fits into the bag j and vice versa.

Unfortunately, sometimes it happens that there are three bags i, j, k such that bags i and j are equal, and bags j and k are equal, but bags i and k are not! It scares mathematician very much because it contradicts with what he knows about the equality relation. If adding a new bag to his collection gives rise to a contradictory triple as described above, he throws the new bag out instead, otherwise he keeps it (and never throws it away afterwards).

Your task is to determine for each bag whether it was kept or thrown away.

Input

The first line contains an integer n — the number of bags ($1 \le n \le 3 \cdot 10^5$).

The next n lines describe the bags. The i-th of these lines contains two integers a_i and b_i — sizes of the bag i in folded and unfolded states respectively ($1 \le a_i < b_i \le 10^9$).

Output

Print n lines. The i-th line should contain the word "`KEPT`" if the mathematician keeps the bag i, and "`THROWN AWAY`" otherwise.

Example

standard input	standard output
10 1 4 3 5 6 8 7 9 1 2 6 7 4 7 5 7 5 8 9 10	KEPT KEPT KEPT KEPT THROWN AWAY THROWN AWAY THROWN AWAY THROWN AWAY KEPT KEPT