# B. Painting Eggs

time limit per test: 5 seconds
memory limit per test: 256 megabytes
input: standard input
output: standard output

The Bitlandians are quite weird people. They have very peculiar customs.

As is customary, Uncle J. wants to have $n$ eggs painted for Bitruz (an ancient Bitland festival). He has asked G. and A. to do the work.

The kids are excited because just as is customary, they're going to be paid for the job!

Overall uncle J. has got $n$ eggs. G. named his price for painting each egg. Similarly, A. named his price for painting each egg. It turns out that for each egg the sum of the money both A. and G. want for the painting equals $1000$.

Uncle J. wants to distribute the eggs between the children so as to give each egg to exactly one child. Also, Uncle J. wants the total money paid to A. to be different from the total money paid to G. by no more than $500$.

Help Uncle J. Find the required distribution of eggs or otherwise say that distributing the eggs in the required manner is impossible.

## Input

The first line contains integer $n$ ($1 \le n \le 10^6$) — the number of eggs.

Next $n$ lines contain two integers $a_i$ and $g_i$ each ($0 \le a_i, g_i \le 1000$; $a_i + g_i = 1000$): $a_i$ is the price said by A. for the $i$-th egg and $g_i$ is the price said by G. for the $i$-th egg.

## Output

If it is impossible to assign the painting, print "-1" (without quotes).

Otherwise print a string, consisting of $n$ letters "G" and "A". The $i$-th letter of this string should represent the child who will get the $i$-th egg in the required distribution. Letter "A" represents A. and letter "G" represents G. If we denote the money Uncle J. must pay A. for the painting as $S_a$, and the money Uncle J. must pay G. for the painting as $S_g$, then this inequality must hold: $|S_a - S_g| \le 500$.

If there are several solutions, you are allowed to print any of them.

### Examples

| input |
| --- |
| 2<br>1 999<br>999 1 |
| **output** |
| AG |

| input |
| --- |
| 3<br>400 600<br>400 600<br>400 600 |
| **output** |
| AGA |

→ **Attention**

Package for this problem was not updated by the problem writer or Codeforces administration after we've upgraded the judging servers. To adjust the time limit constraint, solution execution time will be multiplied by 2. For example, if your solution works for 400 ms on judging servers, then value 800 ms will be displayed and used to determine the verdict.

**Codeforces Round #173 (Div. 2)**

**Finished**

→ **Virtual participation**

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Start virtual contest

→ **Problem tags**

greedy math

No tag edit access

→ **Contest materials**

- Announcement
- Tutorial

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