Haitang and Game

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

Given a set S, dXqwq and Haitang take turns performing the following operations, with dXqwq going first:

- Find a pair (x, y) such that $x, y \in S$ and $\gcd(x, y) \notin S$.
- Insert $\gcd(x, y)$ into S.

The player who cannot make a move loses the game. You need to output the winner when both players play optimally.

Input

Each test contains multiple test cases. The first line contains an integer T ($1 \leq T \leq 20$) — the number of test cases. The description of the test cases follows.

The first line of each test case contains a single integer n ($1 \leq n \leq 10^5$) — the size of set S.

The second line contains n integers $a_1, a_2, \cdots, a_n$ ($1 \leq a_1 < a_2 < \cdots < a_n \leq 10^5$) — the elements of set S.

Output

For each test case, output "dXqwq" if dXqwq will win the game, and "Haitang" if Haitang will win the game.

Example

standard input	standard output
5 1 24 2 44 77 3 6 10 15 4 11 45 1419 19810 8 2 6 9 10 12 17 18 20	Haitang dXqwq Haitang dXqwq dXqwq