

Formula 1 (f1)

The last Formula 1 race was won by Hamilton or Verstappen. The fastest lap also belonged to one of these two pilots. Both pilots completed N laps, which is the length of the race. You are given the lap times of Hamilton (H_1, H_2, \dots, H_N) and Verstappen (V_1, V_2, \dots, V_N), in milliseconds.

Can you determine who won the race and who had the fastest lap? We know that there was a clear winner, so one of the pilots finished the race at least 1 ms ahead of the other one. We also know that all lap times are distinct, so the fastest lap belonged to only one of them.



Figure 1: Verstappen and Hamilton during race.

📎 Among the attachments of this task you may find a template file `f1.*` with a sample incomplete implementation.

Input

The first line contains a single integer N , the number of laps. The second line contains N integers, the lap times of Hamilton ($H_i, i = 1, 2, \dots, N$). The third line also contains N integers, the lap times of Verstappen ($V_i, i = 1, 2, \dots, N$).

Output






You need to print two lines, both of them should contain a single string which is `Hamilton` or `Verstappen`. The first line should contain the name of the winner, and the second line should contain the name of the pilot with the fastest lap.

Constraints

- $1 \leq N \leq 100$.
- $1 \leq H_i \leq 100\,000$ for each $i = 1, 2, \dots, N$.
- $1 \leq V_i \leq 100\,000$ for each $i = 1, 2, \dots, N$.

Scoring

Your program will be tested against several test cases grouped in subtasks. In order to obtain the score of a subtask, your program needs to correctly solve all of its test cases.

- **Subtask 1** (0 points) Examples.

- **Subtask 2** (10 points) $N = 1$.

- **Subtask 3** (15 points) $N = 2$.

- **Subtask 4** (20 points) $N \leq 10$.

- **Subtask 5** (55 points) No additional limitations.


Examples

input	output
2 10000 30000 20000 19999	Verstappen Hamilton
10 11842 25723 19658 96911 39674 10442 97929 24088 39576 11602 46089 94616 86852 61862 70856 50508 50843 65996 53182 41712	Hamilton Hamilton

Explanation

In the **first sample case** Verstappen finished the race in 39999 ms, which is 1 ms ahead of Hamilton, who crossed the finish line after 40000 ms. The fastest lap was Hamilton's first lap with 10000 ms.