

Pingpong Tournament (tournament)

Tommaso is a big fan of ping pong, and he decided to follow the next ping pong tournament in his city: The Ping Pong Peng.



Figure 1: Image from the tournament.

The tournament is in knockout format. There are N competitors, numbered from 0 to $N - 1$, where N is a power of 2. Each competitor has a different level of ping pong skill. The skill level of competitor i is P_i . In a two-player match, the person with the higher skill always defeats the other one.

The organizers pair the competitors in the order of their number, that is, competitor 0 plays competitor 1, competitor 2 plays competitor 3, and so on. Then, the winners advance to the next round, where they are again paired in ascending order of their number (which means that the winner of the first match in the previous order plays the winner of the second match, etc.).

Tommaso would like to know in advance which competitors will reach the final round, and who will be the winner. Can you help him?

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

Input

The input file consists of:

- a line containing integer N , the number of competitors.
- a line containing the N integers P_0, \dots, P_{N-1} , the skill level of each competitor.

Output

The output file must contain a single line consisting of integers `winner`, `runnerup`, the number of the winner and the runner-up of the tournament, respectively.

Constraints

- $2 \leq N \leq 131\,072$.
- N is a power of 2.
- $1 \leq P_i \leq 1\,000\,000\,000$ for each $i = 0 \dots N - 1$.
- All P_i are distinct.

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.

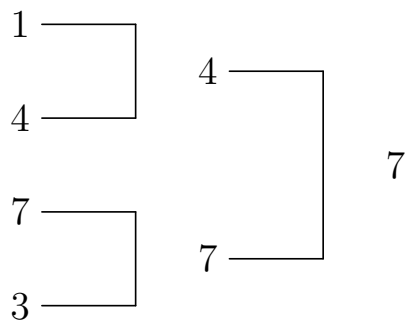
- **Subtask 1** (0 points) Examples.
- **Subtask 2** (30 points) $N = 2$.
- **Subtask 3** (30 points) $N \leq 1024$.
- **Subtask 4** (40 points) No additional limitations.

Examples

input	output
4 1 4 7 3	2 1
8 7 4 10 8 1 6 3 2	2 5

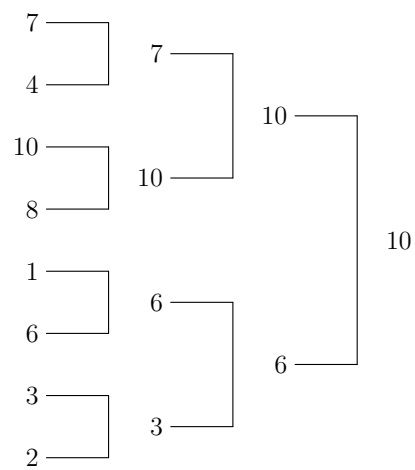
Explanation

In the **first sample case** the tournament is as follows.



The winner is player 2, with skill level 7, and the runner-up is player 1, with skill level 4.

In the **second sample case** the tournament is as follows.



The winner is player 2, with skill level 10, and the runner-up is player 5, with skill level 6.