

# Spectacle

Input file:            **standard input**  
Output file:           **standard output**  
Time limit:            2 seconds  
Memory limit:         1024 megabytes

The chess club is organizing a chess spectacle. The club has  $n$  chess players numbered from 1 to  $n$ , where the  $i$ -th one has a *rating*<sup>1</sup>  $r_i$ . In the spectacle,  $2k$  chess players will participate, who will be paired in  $k$  pairs, and in these pairs, they will simultaneously play  $k$  games. For the spectacle to be thrilling, the club wants the largest rating difference between the chess players in a pair to be as small as possible.

Your task is for every  $k$  from 1 to  $\lfloor \frac{n}{2} \rfloor$  to calculate the smallest possible maximum rating difference of the chess players in a pair, if the club optimally chooses  $2k$  chess players and pairs them.

## Input

In the first line of the standard input, there is one integer  $n$  ( $2 \leq n \leq 200\,000$ ), indicating the number of chess players.

In the second line, there are  $n$  integers, where the  $i$ -th one is  $r_i$  ( $1 \leq r_i \leq 10^{18}$ ), indicating the rating of the  $i$ -th player.

## Output

In the only output line, there should be  $\lfloor \frac{n}{2} \rfloor$  integers. The  $k$ -th one should indicate the sought result if the club wants to create  $k$  pairs of chess players.

## Example

standard input	standard output
6 100 13 20 14 10 105	1 5 6

## Note

For  $k = 1$ , we need to pair chess players with numbers 2 and 4.

For  $k = 2$ , we can, for example, create the following pairs: (4, 5) and (1, 6).

For  $k = 3$ , we need to create the following pairs: (1, 6), (2, 5), and (3, 4).

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<sup>1</sup>A *rating* in chess is a number describing the skills of a player. The higher this number, the better the player is at chess.