Shuffling Cards

Kai just invented a new method to shuffle a deck of cards. This method works with any deck of $m = 2^n$ cards for any non-negative integer n. Kai explains the shuffling procedure as follows.

The first thing you need to do is lay all the cards in a single row on the table. Then you take the first card from the left, put it below the first row, as the left-most card of a second row; take the next card from the first row and put it on top of the first card in the second row; now you take the third card and move it to the right of the little pile of cards that you just created in the second row and put the fourth card from the first row on top of it. Continue this pattern until you have moved all the cards from the first row to the second row.

In the second row you now have $m/2$ piles of two cards each. Now keep shuffling: take the top card from the first pile and move it one row below, then take the top card from the second pile and move it on top of the first card on the row below, followed by the next card from the first pile, and then another card from the second pile. In essence, you just built a pile of four cards by shuffling the first two piles of two cards, by picking iteratively from the first and second pile. Do the same with the next pair of piles on the second row, and continue on until you have moved all the cards from the second to the third row.

Now you're getting the gist of the process. You start from a row of piles of the same number of cards, and shuffle them in a row of half the number of piles, each with twice the number of cards. So, continue this process until you are left with a single big pile.

Kai wants you to help him automate this procedure with a computer. This is what you need to do: write a program that, given the initial sequence of cards in the deck laid out from left to right, prints out the cards as they appear in the final pile, from top to bottom.

Input

The first line contains a single number, the non-negative integer $n < 20$. The second line contains the $m = 2^n$ cards, $c_1, c_2, \ldots, c_m$ each identified by a number $1 \le c_i \le 2^n$. The card numbers are in the initial order of the first row and are separated by spaces.

Output

One line with the card numbers in the correct order, separated by spaces.

Sample input 1

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2
1 3 4 2
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Sample output 1

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4 1 2 3
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Limits

Time limit is 1 seconds. Memory limit is 256 megabytes.