

Task: TAS

Shuffling

UFAM Workshop, contest #2. Source file `tas.*` Available memory: 256 MB.

Byteasar has mastered recently a spectacular, recursive procedure of shuffling a deck of cards. To shuffle a deck with exactly two cards he just changes the order of these cards in the deck. To shuffle a deck consisting of 2^k cards ($k \geq 2$) he follows the procedure: First the deck is split into two parts of equal sizes – the upper part and the lower part. The parts (consisting of 2^{k-1} cards each) are then independently (recursively) shuffled. Finally, the shuffled lower part is put onto the shuffled upper part.

Byteasar has a deck with 2^n cards, each card has some number written on it. Now he perform the above procedure exactly t times. He would like to know what numbers will appear on subsequent cards after all shuffles.

Input

In the first line of the input there are two integers n and t ($1 \leq n \leq 20$, $1 \leq t \leq 10^9$). In the second line there are 2^n integers a_1, \dots, a_{2^n} ($1 \leq a_i \leq 10^9$); a_i specifies the number written on the i -th card from the top in Byteasar's deck.

Output

In the only line of the input you must write 2^n integers (separated by single spaces) specifying the numbers on subsequent cards in the Byteasar's deck after t shuffles.

Example

For the input data:

```
2 1
2 4 1 5
```

the correct result is:

```
5 1 4 2
```