D. Bookshelves

time limit per test: 1 second
memory limit per test: 256 megabytes
input: standard input
output: standard output

Mr Keks is a typical white-collar in Byteland.

He has a bookshelf in his office with some books on it, each book has an integer positive price.

Mr Keks defines the value of a shelf as the sum of books prices on it.

Miraculously, Mr Keks was promoted and now he is moving into a new office.

He learned that in the new office he will have not a single bookshelf, but exactly k bookshelves. He decided that the beauty of the k shelves is the bitwise AND of the values of all the shelves.

He also decided that he won't spend time on reordering the books, so he will place several first books on the first shelf, several next books on the next shelf and so on. Of course, he will place at least one book on each shelf. This way he will put all his books on k shelves in such a way that the beauty of the shelves is as large as possible. Compute this maximum possible beauty.

Input

The first line contains two integers n and k ($1 \le k \le n \le 50$) — the number of books and the number of shelves in the new office.

The second line contains n integers $a_1, a_2, \ldots a_n$, ($0 < a_i < 2^{50}$) — the prices of the books in the order they stand on the old shelf.

Output

Print the maximum possible beauty of k shelves in the new office.

Examples

input
10 4 9 14 28 1 7 13 15 29 2 31
output
24

input
7 3 3 14 15 92 65 35 89
output
64

Note

In the first example you can split the books as follows:

(9 + 14 + 28 + 1 + 7)&(13 + 15)&(29 + 2)&(31) = 24.

In the second example you can split the books as follows:

(3 + 14 + 15 + 92)&(65)&(35 + 89) = 64.