C. Party Lemonade

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

A New Year party is not a New Year party without lemonade! As usual, you are expecting a lot of guests, and buying lemonade has already become a pleasant necessity.

Your favorite store sells lemonade in bottles of n different volumes at different costs. A single bottle of type i has volume 2^{i-1} liters and costs c_i roubles. The number of bottles of each type in the store can be considered infinite.

You want to buy at least L liters of lemonade. How many roubles do you have to spend?

Input

The first line contains two integers n and L ($1 \le n \le 30$; $1 \le L \le 10^9$) — the number of types of bottles in the store and the required amount of lemonade in liters, respectively.

The second line contains n integers $c_1, c_2, \ldots, c_n$ ($1 \le c_i \le 10^9$) — the costs of bottles of different types.

Output

Output a single integer — the smallest number of roubles you have to pay in order to buy at least L liters of lemonade.

Examples

input
4 12 20 30 70 90
output
150

input
4 3 10000 1000 100 10
output
10

input
4 3 10 100 1000 10000
output
30

input
5 787787787 123456789 234567890 345678901 456789012 987654321
output
44981600785557577

Note

In the first example you should buy one 8-liter bottle for 90 roubles and two 2-liter bottles for 30 roubles each. In total you'll get 12 liters of lemonade for just 150 roubles.

In the second example, even though you need only 3 liters, it's cheaper to buy a single 8-liter bottle for 10 roubles.

In the third example it's best to buy three 1-liter bottles for 10 roubles each, getting three liters for 30 roubles.