

Problem G. Pop music

Input file: *standard input*
Output file: *standard output*
Time limit: 5 seconds
Memory limit: 256 mebibytes

Radewoosh loves pop music. It is relaxing, it is great to dance to and even helps in programming. All these advantages, however, require a good tune of the melody with the beat³.

Radewoosh has just created a new melody and is going to match some good beats to it. The melody lasts n seconds and some of its moments can be much better than others. The quality of the i -th second of the melody is described by the integer a_i (possibly negative). He needs to select the non-negative integers b_i – beat gain coefficients. The coefficient strengthens the second $C(b_i)$ -fold, where $C(b_i)$ is the number of *ones* in binary representation of b_i . For example, choosing $b_i = 13$ gives you a threefold gain of i -th second of the melody, because the binary representation of 13 is 1101 and it contains three *ones*.

The final quality of the entire song can be described as:

$$a_1 \cdot C(b_1) + a_2 \cdot C(b_2) + \dots + a_n \cdot C(b_n).$$

Everyone likes songs with the increasing beat gain and Radewoosh is no exception. The beat gain coefficients must form an increasing sequence of non-negative integers with a certain upper limit of m :

$$0 \leq b_1 < b_2 < \dots < b_n \leq m.$$

Radewoosh's goal is to choose beat gain coefficients to maximize the final quality of the song.

What is the greatest value he can get?

Input

The first line of the standard input contains two integers n, m ($1 \leq n \leq 200, n-1 \leq m \leq 10^{18}$) – the length of the song in seconds and the upper limit for the beat gain coefficients.

The second line contains N integers $a_1, \dots, a_n$ ($-10^{14} \leq a_i \leq 10^{14}$) denoting the quality of the corresponding seconds of the melody.

Output

The output should contain one integer – the maximum possible final quality of the song.

Examples

standard input	standard output
3 5 2 -1 3	9
3 2 1 1 -1	0

Explanation to the first example: The melody consists of three seconds with qualities 2, -1, 3 respectively. Note that the quality of the second may be negative! The optimal sequence b is $b_1 = 3, b_2 = 4, b_3 = 5$. Then we get the following quality of the song:

$$a_1 \cdot C(b_1) + a_2 \cdot C(b_2) + a_3 \cdot C(b_3) = 2 \cdot C(3) + (-1) \cdot C(4) + 3 \cdot C(5) = 2 \cdot 2 + (-1) \cdot 1 + 3 \cdot 2 = 9$$

³In Polish, “bit” and “beat” are the same word, and then the statement is more entertaining, but that doesn't make that much sense in English. Sorry!