

Ambitious Utopion Osman

Time Limit: 1.0s **Memory Limit:** 256M

Ambitious Utopion Osman is a space χ l ω delivery employee. They spend their days flying from planet to planet with their rocket, delivering χ l ω . But the χ l ω demand of their solar system is increasing day by day!

The amount of χ l ω Ambitious Rocket carries would require complicated space maths in AUO's universe, but luckily for us, the calculations are simple. It is sufficient to XOR (bitwise xor operation) the distance to be traveled with the liters of l ϵ n η the rocket has.

AUO should always travel A_i lightyears to reach the i 'th planet. It doesn't matter where the Ambitious Rocket is located.

AUO has M liters of χ l ω in total and AUO needs to visit N planets in total. Can you calculate the maximum amount of l ϵ n η AUO can take on their rocket without the amount of χ l ω they carry exceeding M ?

- note: χ l ω and l ϵ n η act differently from the matter we understand. Upon delivering χ l ω , Ambitious Rocket's l ϵ n η doesn't decrease.

Input

The first line will include the integers N and M .

The next will have N positive integers in total. A_i equals to the distance needs to be traveled to reach that planet.

Batch #1:

- $1 \leq N \leq 100$
- $1 \leq A_i \leq 100$
- $1 \leq M \leq 10^4$

Batch #2:

- $1 \leq N \leq 10^5$
- $1 \leq A_i \leq 10^{12}$
- $1 \leq M \leq 10^{15}$

Output

Print the amount of l ϵ n η AUO should put into the Ambitious Rocket.

- If the amount of χ l ω that can be delivered always exceeds M , print "-1".

Samples

Input:

```
6 20
3 4 3 1 3 1
```

Output:

```
3
```

Input:

```
6 40
3 8 4 4 6 9
```

Output:

```
7
```

Girdi:

```
5 10
3 2 4 4 12
```

Çıktı:

```
-1
```

Explanation

1. Input

- $(3 \oplus 3) + (3 \oplus 4) + (3 \oplus 3) + (3 \oplus 1) + (3 \oplus 3) + (3 \oplus 1)$
- $0 + 7 + 0 + 2 + 0 + 2 = 11 \leq 20$

2. Input

- $(7 \oplus 3) + (7 \oplus 8) + (7 \oplus 4) + (7 \oplus 4) + (7 \oplus 6) + (7 \oplus 9)$
- $4 + 15 + 3 + 3 + 1 + 14 = 40 \leq 40$

3. Input

- For all non-negative integers, the amount of $\chi\lambda\omega$ that can be delivered always exceeds **M**. Therefore there's no valid answer.