Problem I
Rectangle Tiling
Time limit: 1 second

Consider a rectangle with integer side lengths. A square tiling of the rectangle is a covering of the entire region using non-overlapping squares whose sides are parallel with those of the rectangle. In a square tiling, no square may overhang (extend beyond the rectangle's boundary).

You have a collection of squares with side lengths being powers of 2. Find a square tiling of the rectangle using the fewest squares possible, or, indicate that it cannot be done.

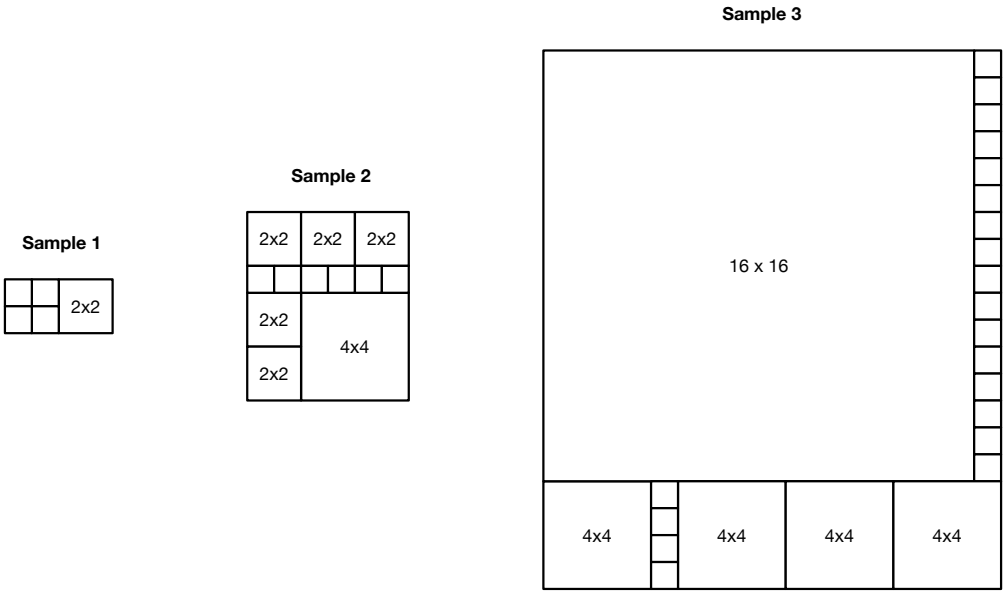


Figure I.1: Optimal square tilings for the first three sample inputs. The small unlabelled tiles are 1×1 tiles.

Input

The first line of input contains three integers W, H and N ($1 \leq W, H \leq 2^{50}$ and $1 \leq N \leq 51$). Here, W and H indicate the dimensions of the rectangle. The next line contains N integers $a_0, a_1, \ldots, a_{N-1}$ where a_i ($0 \leq a_i \leq 2^{51}$) is the number of $2^i \times 2^i$ squares you own.

Output

If there is a square tiling of a $W \times H$ rectangle using the squares you own, output the minimum number of squares needed in such a square tiling. Otherwise, output -1 if there is no square tiling of the rectangle using the squares you own.

Sample Input 1	Sample Output 1
4 2 2 5 1	5

Sample Input 2	Sample Output 2
6 7 3 10 10 10	12

Sample Input 3	Sample Output 3
17 20 5 20 0 4 0 1	25

Sample Input 4	Sample Output 4
4 2 3 3 1 10	-1