Mountain

Input file:	`standard input`
Output file:	`standard output`
Time limit:	1 second
Memory limit:	512 megabytes

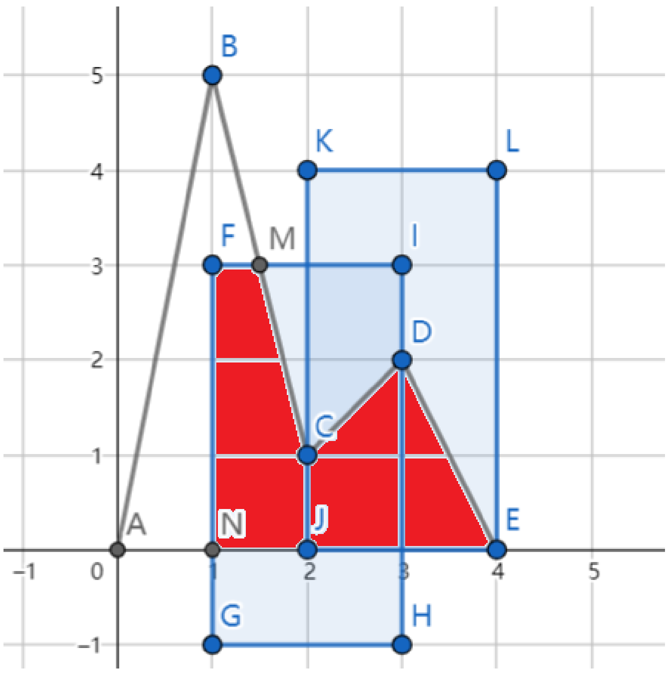
DreamGrid is climbing a mountain. The mountain is described by a polyline on a 2D plane:

$$(0,0) - (1,h_1) - (2,h_2) - \cdots - (n,h_n) - (n+1,0)$$

The region surrounded by the polyline and the x-axis denotes the mountain.

DreamGrid takes n pictures at the points (i,h_i) for each integer i where $1 \le i \le n$. A picture covers a rectangle on the plane. Formally, a picture taken at (i,h_i) covers all the points (x,y) where $i-W \le x \le i+W$ and $h_i - H \le y \le h_i + H$.

However, his hard disk has limited space. When he saves the pictures into his hard disk, he can keep only K pictures. He wants to maximize the total area of the mountain which is covered by at least one picture. You are asked to find the maximum area for $K = 1, 2, \cdots, n$.



The graph above is a sample where $n = 3, W = 1, H = 2$. The polyline describing the mountain is A-B-C-D-E. DreamGrid keeps 2 pictures taken at C and D. The red area (polygon F-M-C-D-E-N-F) is the part of the mountain covered by the kept pictures.

Input

The first line of the input contains three integers n, W and H ($1 \le n \le 200$, $1 \le W \le 5$, $1 \le H \le 10\,000$), indicating the number of points on the polyline and the size of the pictures.

The second line contains n integers $h_1, h_2, \cdots, h_n$ ($1 \le h_i \le 10\,000$), indicating the y coordinates of the n points on the polyline.

Output

Output n lines, the i-th line contains a float number indicating the maximum area when $K = i$.

Your answer is acceptable if its absolute or relative error does not exceed 10^{-6}.

Formally speaking, suppose that your output is x and the jury's answer is y. Your output is accepted if and only if $\frac{|x-y|}{\max(1,|y|)} \le 10^{-6}$.

Example

standard input	standard output
3 1 2 2 1 3	3.5000000000 4.5000000000 5.1666666667