

A wall

Vasiliy decided to paper the walls. The wall's dimension is N meters in height and M meters in width. It is known that the wallpapers are sold in rolls with 1 meter in width and K meters in length. The walls are vertically papered starting from the ceiling down to the floor. Vasiliy wants to paper the walls with no horizontal joints, in other words, one piece of wallpaper is glued to the wall from the ceiling to the floor. He can cut off the required piece from a roll. The remaining part of this roll can go to wastes if it is less than required. Which is the least number of the wallpaper rolls Vasiliy should buy, and how many meters of wallpapers will go to wastes?

Input and output. The app recognizes the integers N , M , and K ($1 \leq N \leq 100$, $1 \leq M \leq 100$, $N \leq K \leq 100$) separated by space in one line.

The app displays 2 integers separated by space – minimum number of the wallpaper rolls and the total length of the wallpapers to go to wastes.

Sample.

Input 6 7 20

Output 3 18

Zigzag

A sequence of the integers is called zigzag if it has no monotone non-increasing and no monotone non-decreasing subsequence of the 3 elements in the array. The sequence is given. What is the minimum number of the elements to be inserted in the sequence to obtain a zigzag?

Input and output: the app reads the number of the elements in the sequence in the first line N ($3 \leq N \leq 10000$) and then in the second line N numbers – the sequence of elements (not larger than 1000 by the absolute value each) separated with space.

The app displays only one number – the target value.

Sample:

Input: 6 1 4 7 9 7 4

Output: 3

A crack in an ice sheet

Arctic expedition members wintered on the ice sheet and faced a misfortune: the ice sheet broke down, and they appeared to be on its small piece. They had to cross a wide crack as quickly as possible. They had only a 2-seat inflatable boat. The time required for one expedition member to cross the crack on this boat is known. If there are 2 members in this boat, the crossing time equals the time required for the slowest one in the boat to cross the crack. What is the minimum time required to cross the crack for all Arctic expedition members?

Input and output: The app reads the positive integer N ($3 \leq N \leq 10000$) – the number of the expedition members (in the first line), and then in each N line it reads one positive integer not larger than 10000 – the crossing time for each member.

The app displays one number – the target value.

Sample:

Input 4

1 6 7 8

Output 23

CrossGroup

2032 Olympic Games are planned to include a new type of sports – crossgroup. A team consists of N sportsmen and a captain, they have a specially designed vehicle which can carry the captain and no more than 4 sportsmen at a time. The teams start at one time. The team wins if it is the first to cross the finish line with no team member left behind. What is the minimum time required for the competing team if the team consists of N sportsmen (excluding the captain-driver) ($1 \leq N \leq 30$), the vehicle speed is constant and equals U km/h, each team member can run at a fixed speed of V km/h with no time limitation, and the distance is S km. It is taken for granted that the trained sportsmen do not allocate any time on getting on/off the vehicle and its turnaround maneuver.

Input and output. The app recognizes the integers N , U , V and S separated by space (all, except for N , are positive ones, not larger than 100). The app displays only one number – the target value right down to **0.001**.

Sample

Input 8 30 5 15

Output 1.056