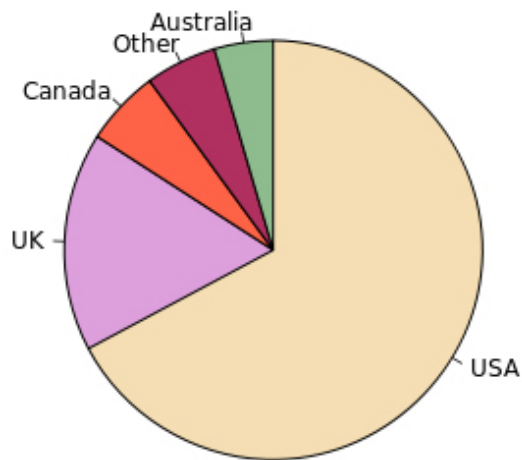


## Problem G. Graph visualizing

According to Wikipedia, pie chart is a circular statistical graphic which is divided into slices to illustrate numerical proportion. In a pie chart, the arc length of each slice (and consequently its central angle and area), is proportional to the quantity it represents. There are many variations of pie chart, but in this problem, we only consider pie charts with a circular shape (without holes or anything).



An example of a pie chart with 5 options.

You just conducted a survey for your research. Each person had to choose exactly one of the  $n$  options, and as a result,  $a_i$  people chose the  $i$ -th ( $1 \leq i \leq n$ ) option. You are going to make a pie chart with radius  $r$ , corresponding to this data. The area of option  $i$  must be proportional to  $a_i$ , and the sum of all areas must be equal to the pie chart's area.

Given the number of options  $n$ , the radius of the pie chart  $r$ , and the result of the survey  $a_1, a_2, \dots, a_n$ , your task is to calculate the area of each option in the pie chart.

### Input

Your input consists of an arbitrary number of records, but no more than 50. Each record starts with a line containing two integers  $n$  ( $1 \leq n \leq 10$ ) and  $r$  ( $1 \leq r \leq 100$ ), denoting the number of options and the radius of the pie chart,

respectively. The next line contains  $n$  integers indicating the statistics  $a_1, a_2, \dots, a_n$  separated by spaces, subject to  $1 \leq a_i \leq 50$ .

The end of input is indicated by a line containing only the value  $-1$ .

## Output

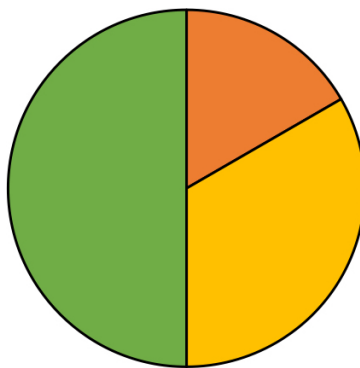
For each record, print the area of each option in the pie chart, separated by a space. Each area should be truncated to a multiple of 0.001, and formatted to three digits after the decimal period. The order of output should be the same as the input.

## Example

standard input	standard output
3 5 1 2 3 4 8 9 6 1 7 -1	13.089 26.179 39.269 78.676 52.450 8.741 61.192

## Note

The following figure is a pie chart corresponding to the first sample:



Note that the 3rd option has area  $25\pi/2 \approx 39.2699082$ , and you should print '36.269' instead of '36.270'. *Do not round the area!*

## Time Limit

1 second.