6175 Maximum Random Walk

Consider the classic random walk: at each step, you have a 1/2 chance of taking a step to the left and a 1/2 chance of taking a step to the right. Your expected position after a period of time is zero; that is, the average over many such random walks is that you end up where you started. A more interesting question is what is the expected rightmost position you will attain during the walk.

Input

The first line of input contains a single integer P, $(1 \leq P \leq 15)$, which is the number of data sets that follow Each data set should be processed identically and independently.

Each data set consists of a single line of input consisting of four space-separated values. The first value is an integer K, which is the data set number. Next is an integer n, which is the number of steps to take $(1 \leq n \leq 1000)$. The final two are double precision floating-point values L and R which are the probabilities of taking a step left or right respectively at each step $(0 \leq L \leq 1, 0 \leq R \leq 1, 0 \leq L+R \leq 1)$.

Note: the probably of not taking a step would be $1 - L - R$.

Output

For each data set there is a single line of output. It contains the data set number, followed by a single space which is then followed by the expected (average) rightmost position you will obtain during the walk, as a double precision floating point value to four decimal places.

Sample Input

```
4
1 1 0.5 0.5
2 4 0.5 0.5
3 10 0.5 0.4
4 1000 0.5 0.4
```

Sample Output

```
1 0.5000
2 1.1875
3 1.4965
4 3.9995
```