I. Casino

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Time limit:   1 second
Memory limit:   65535 kBytes
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Description

A new game called "Double or Nothing" has appeared in the casinos of Las Vegas. The game is played by a single player against the computer, which acts as the dealer during the game. The simplified rules of the game are as follows: each time, the player decides the stake and places a chosen amount of money in the center of the table. The dealer matches this amount with an equal bet in the center. The dealer then decides whether to grant the entire amount on the table to the player or to keep it for themselves. The following rules apply to the game:

- The player initially has a certain amount of money, V, in dollars ($), which is entered into the game program as a virtual amount at the beginning.
- The player can only bet as much money as they currently possess. This amount changes after each round, sometimes decreasing, sometimes increasing. As a result, the stake value can vary in each round, potentially reaching the full amount or even zero.
- The game consists of $d + z$ rounds, meaning the dealer is obligated to double the amount d times (grant the amount on the table to the player) and zero out the amount z times (keep the amount for themselves).
- The dealer always plays optimally, making decisions to maximize their winnings by the end of the game, as long as they can choose from both types of actions.
- The stake can be a fractional amount. In such cases, the value bet on the table is represented by two natural numbers a and b, with the stake value expressed as the irreducible fraction a/b.

Task Requirements

Given the values of V, d, and z for n games, calculate the final amount in the form of an irreducible fraction u/v (where u and v are natural numbers that are relatively prime) for each V, d, z triple, representing the player's final winnings. Definitions:

- n input value, the number of games.
  For each game:
- V input value, the player's starting amount.
- d input value, the number of rounds in which the player wins the amount.

- z input value, the number of rounds in which the player loses the amount.
- u v output values, where the fraction u/v represents the final amount won by the player.

Input

The first line contains the value of n, the number of games. The following n lines each contain three natural numbers V, d, and z, separated by spaces, as described above.

Output

The output will contain n lines. Each line contains two natural numbers u and v, separated by a space, which represent the irreducible fraction u/v for the maximum winnings achievable by the player in each game.

Constraints

- $0 \leq V \leq 1000$, a natural number
- $0 < z, d, n \leq 15$, natural numbers
- The result always fits within the 64 bit integer type.

Example

Input	Output
4 500 0 1 623 1 0 300 1 1 299 1 1	500 1 1246 1 400 1 1196 3

Explanation: n=4, so four games will be played.

First game: The player starts with \$500. The dealer has $d = 0$ doubles and $z = 1$ chances to keep the amount.

In this case, the player plays with a \$0 stake, which the dealer keeps, so the player loses nothing and retains \$500, written as the irreducible fraction 500/1, so the output will be: 500 1.

Second game: The player starts with \$623. The dealer has $d = 1$ double and $z = 0$ chances to keep the amount.

Here, the player stakes the full \$623, and since the dealer must double, the final amount is \$1246, written as 1246/1, so the output will be: 1246 1.

Third game: The player starts with \$300. The dealer has $d = 1$ double and $z = 1$ chances to keep the amount.

The player's first stake is \$100. If the dealer returns it, the player gains \$100 and has \$400. Now the dealer has only one z move left, and the player stakes \$0 in the second round, which the dealer keeps, leaving the player with \$400.

Alternatively, if the dealer keeps the \$100 initially, the player is left with \$200. In the second round, the dealer doubles the player's full amount, returning \$400. Either way, the player ends with \$400, written as 400/1, so the output will be: 400 1.

Fourth game: the player's starting amount is \$299. The dealer has $d = 1$ doubling option and $z = 1$ zeroing option. The player's first bet will be 299/3, or approximately \$99.67.

If the dealer returns it, the player wins \$99.67 and now has 299+299/3=1196/3, or approximately \$398.67. The dealer now has only one zeroing option left. In the second round, the player bets \$0, which the dealer must keep, leaving the player with \$398.67.

If, instead, the dealer keeps the \$99.67 in the first round, the player is left with approximately \$199.33. The dealer then has only one doubling option remaining. In the second round, the player bets their full amount, doubling it to get an additional \$199.33, resulting in a final total of \$398.67.

Therefore, regardless of the dealer's moves, the player will finish the game with \$398.67 (written in irreducible fraction form as 398.67=1196/3), so the output will be: 1196 3.

If in the first round the player were to risk \$99, the dealer would choose the doubling operation, and the player would end up with \$398. In the second round, the player would not bet anything and would keep the \$398, which is less than in the case of optimal play.

If in the first round the player were to risk \$100, the dealer would keep the amount, and the player would be left with \$199. In the second round, the player would bet the entire amount, which would double, resulting in a final profit of 2 * \$199 = \$398, which is also less than in the case of optimal play.