

# Guessing Game

*Filename: guessing*

Adam and Jimmy love to play a simple guessing game. They start by choosing some range of numbers and then Adam thinks of any integer within that range (including the start and end). Jimmy then tries to guess the number. If he is correct, he wins. Otherwise, Adam will tell him whether the true number is lower than his guess or higher than his guess. Jimmy will then continue guessing until he finally guesses the correct number. Jimmy's score is then equal to the number of guesses it took until he guessed correctly (lower scores are better).

## The Problem:

Jimmy has devised a plan which he believes may minimize his score and help him guess the number that Adam is thinking of as quickly as possible. His plan is outlined as follows:

1. Given the range of possible numbers, find the middle number (by averaging the two endpoints and rounding up to the nearest integer if necessary) and then guess that number.
2. If he is correct, he wins! Otherwise, if his guess was too high, he will repeat his strategy with a new range of possible numbers with the same lower bound as before and with an upper bound of one number less than his guess. If his guess was too low, he will repeat his strategy with a new range of possible numbers with a lower bound of one number higher than his guess and with the same upper bound.

Here is an example of Jimmy's strategy in action with the range **[1, 100]** and Adam's number being **33**:

1. Range is initially **[1, 100]**. Jimmy incorrectly guesses **51** which is the middle number between 1 and 100 rounded up (true middle number is 50.5). His guess of **51** was too high.
2. Range is now **[1, 50]**. Jimmy incorrectly guesses **26** which is too low.
3. Range is now **[27, 50]**. Jimmy incorrectly guesses **39** which is too high.
4. Range is now **[27, 38]**. Jimmy correctly guesses **33** and wins with a score of **4**.

Your task is to write a program which, given a range of possible numbers Adam can choose from and given Adam's chosen number, can calculate Jimmy's final score assuming he follows his strategy described above.

## The Input:

The first line of the input will contain a single, positive integer,  $n$ , representing the number of times Adam and Jimmy are planning to play the guessing game. The next  $n$  lines will each contain 3 integers,  $a$ ,  $b$  and  $x$  ( $0 \leq a \leq x \leq b \leq 1,000,000$ ), where  $a$  to  $b$  is the range of numbers considered and  $x$  is Adam's selected integer.

**The Output:**

For each guessing game, output one line with the format “Game # $i$ :  $g$  guesses” where  $i$  represents the game’s order given in the input (starting with 1) and  $g$  represents the number of guesses it will take Jimmy to win the game. In the special case that Jimmy will win in 1 guess exactly, output “Game # $i$ : 1 guess” instead, maintaining that  $i$  represents the game’s order given in the input starting with 1.

**Sample Input:**

```
3
1 100 33
1 3 2
11 19 14
```

**Sample Output:**

```
Game #1: 4 guesses
Game #2: 1 guess
Game #3: 3 guesses
```