Number Game

Arya and Bran are playing a game. Initially, two positive integers **A** and **B** are written on a blackboard. The players take turns, starting with Arya. On his or her turn, a player can replace **A** with **A** - **k***B** for any positive integer **k**, or replace **B** with **B** - **k***A** for any positive integer **k**. The first person to make one of the numbers drop to zero or below loses.

For example, if the numbers are initially (12, 51), the game might progress as follows:

- Arya replaces 51 with 51 - 3*12 = 15, leaving (12, 15) on the blackboard.
- Bran replaces 15 with 15 - 1*12 = 3, leaving (12, 3) on the blackboard.
- Arya replaces 12 with 12 - 3*3 = 3, leaving (3, 3) on the blackboard.
- Bran replaces one 3 with 3 - 1*3 = 0, and loses.

We will say (**A**, **B**) is a *winning* position if Arya can always win a game that starts with (**A**, **B**) on the blackboard, no matter what Bran does.

Given four integers A_1, A_2, B_1, B_2, count how many winning positions (**A**, **B**) there are with $A_1 \leq A \leq A_2$ and $B_1 \leq B \leq B_2$.

Input

The first line of the input gives the number of test cases, **T**. **T** test cases follow, one per line. Each line contains the four integers A_1, A_2, B_1, B_2, separated by spaces.

$1 \leq T \leq 250$.
$1 \leq A_1 \leq A_2 \leq 1,000,000$.
$1 \leq B_1 \leq B_2 \leq 1,000,000$.
$A_2 - A_1 \leq 999,999$.
$B_2 - B_1 \leq 999,999$.

Output

For each test case, output one line containing "Case #x: y", where x is the case number (starting from 1), and y is the number of winning positions (**A**, **B**) with $A_1 \leq A \leq A_2$ and $B_1 \leq B \leq B_2$.

Example

Input:
3
5 5 8 8
11 11 2 2
1 6 1 6

Output:
Case #1: 0
Case #2: 1
Case #3: 20