SWE2004: Principles in Programming(Spring 2015)

Description

Owning a candy store is tough! You have to optimize all kinds of things. Lately you've been selling a very popular kind of candy called Whizboppers. These candies become rotten very quickly, which gives them the following properties:

- You must buy new Whizboppers from your supplier every morning.
- You must sell Whizboppers in the boxes you bought from your supplier that morning.

You can order Whizboppers from your supplier in boxes that contain any integer number of grams.

Every day up to k people visit your store, and, starting from the first person, they will choose an integer number of cents to spend on Whizboppers: between 1 and C cents inclusive. You're going to sell Whizboppers for 1 cent per gram; so if a person wants to spend 4 cents, you will give that person exactly 4 grams of candy. You might do this by giving the person a 4-gram box, or perhaps a 2-gram box and two 1-gram boxes.

What is the minimum number of boxes you need to order so that, no matter what amount each person orders, you can always give all of the people the mass of Whizboppers they want?

Note: When a person chooses how much candy to buy, you know what other people have already bought, but you don't know what future people will buy.

For example, if up to 2 people visit your store every day, and they spend up to 2 cents each (k=2, C=2), you could buy four 1-gram boxes from your supplier. But you can do better: if you buy two 1-gram boxes and one 2-gram box, you can satisfy your customers. Here's how:

First Person	Boxes given	Second Person	Boxes given
2cent	1 * 2-gram	2cent	2 * 1-gram
		1cent	1 * 1-gram
1cent	1 * 1gram	2cent	1 * 2-gram
		1cent	1 * 1-gram

Input

The first line of the input gives the number of test cases, T. T lines follow, each of which contains two integers: k and C, the maximum number of people and the maximum number of cents each person may spend.($1 \leq T \leq 100$, $1 \leq k \leq 1000$, $1 \leq c \leq 10^{12}$)

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 minimum number of boxes you need to order every day.

Sample Input

4
1 5
2 2
10 3
2 50

Sample Input

Case #1: 3
Case #2: 3
Case #3: 19
Case #4: 11