

## Problem J

### Bombs

#### Description

Terrorists are around everywhere, they always make troubles by detonating bombs. The terrorist have some gunpowder to make bombs, different gunpowder has different damage, every kind of gunpowder can use any times, and the power of one bomb is the product of the gunpowder it consists of. Let's see how they make a bomb.

At the beginning they decide to use  $X$  parts of gunpowder to make a bomb, and then choose  $X$  parts of gunpowder, every time the damage of the gunpowder they choose can't be smaller than the last time they choose excepting the first time. After choosing  $X$  parts gunpowder terrorists get  $\text{gunpowder}[1]$ ,  $\text{gunpowder}[2]$  ...  $\text{gunpowder}[X]$  ( $\text{gunpowder}[1] \leq \text{gunpowder}[2] \leq \dots \leq \text{gunpowder}[X]$ ), and then mix the  $X$  parts gunpowder to generate a bomb with power of the product of the damage of the gunpowder. Terrorists make bombs in some order, if they make bomb\_A before bomb\_B one of the following conditions should meet.

- ◆ Terrorists use less parts gunpowder to make bomb\_A than bomb\_B.
- ◆ Terrorists both use  $X$  parts of gunpowders to make bomb\_A and bomb\_B. There exist an integer  $j$  ( $j \leq X$ ), for all  $i < j$ ,  $\text{gunpowder\_A}[i] = \text{gunpowder\_B}[i]$  and  $\text{gunpowder\_A}[j] < \text{gunpowder\_B}[j]$ .

Now, the police get the gunpowder by some way, police find that the gunpowder's damage is in the range of  $A$  to  $B$  ( $A, B$  included), police want to know the  $K$ -th bomb with the power in the range of  $L$  to  $R$  ( $L, R$  included).

#### Input

There are multiple cases, the first line is an integer  $T$  denoting the number of the case, for each case has five integers  $A, B, L, R, K$  in a line.  $A, B$  denote the damage range of the gunpowder.  $L, R$  denote the power range of the bomb,  $K$  denotes the  $K$ -th bomb with the power in the range  $L$  to  $R$  that police want to know.

$2 \leq A \leq B \leq 10^6$

$1 \leq L \leq R \leq 10^9$

$1 \leq K \leq 10^6$

#### Output

For each case output in the format in the first line "Case #x: y"  $x$  is the case number start from 1,  $y$  is the power of the bomb, and the second line with the gunpowder in the order they choose. If there is no more than  $K$  bombs in the range of  $L$  to  $R$  just output one line "Case #x: -1".

## Sample Input

```
4
2 2 1 4 1
2 5 1 4 4
73 23642 12 20903 29401
2 50 1 1000000000 815180
```

## Sample Output

```
Case #1: 2
2
Case #2: 4
2 2
Case #3: -1
Case #4: 59200
4 4 5 20 37
```

## Hint

In the second case we have 4 kinds of gunpowder with damage 2, 3, 4, 5.  
the first bomb is “2” with power of 2  
The second bomb is “3” with power of 3  
The third bomb is “4” with power of 4  
The fourth bomb is “5” with power of 5  
The fifth bomb is “2 2” with power of  $2 * 2 = 4$   
So the 4-th bomb with power in the range of 1 to 4 is “2 2”.