

7847 Divisor Game

RR and Flash are playing a game with a list of numbers that are distinct initially. In this game, two players will take alternative turns. In each turn, a player can select a number X in the list and replace it with number D if D is a divisor of X and D is smaller than X .

For example, with the list $(1, 3, 12)$, the valid moves are:

- replace 12 with one of the following numbers: 1, 2, 3, 4 or 6;
- replace 3 with 1.

The player who takes the last move will lose the game. At the beginning, Flash will select a nonempty initial list of distinct numbers between A and B inclusively and RR is the one who makes the first move.

Your task is to calculate the number of possible ways for Flash to select the initial list where he can be sure that he would win the game assuming both players play optimally.

Input

The input consists of several datasets. The first line of the input contains the number of datasets, which is a positive number and is not greater than 100. The following lines describe the datasets.

Each dataset is described by a single line that contains 2 integers A and B ($1 < A \leq B \leq 10^{12}$, $B - A \leq 10^5$).

Output

For each dataset, write out on one line the result *modulo* $10^9 + 7$.

Sample Input

```
4
2 4
2 5
2 6
2 7
```

Sample Output

```
2
4
8
16
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