

3998 Prime k -tuple

$\{p_1, \dots, p_k : p_1 < p_2 < \dots < p_k\}$ is called a prime k -tuple of distance s if p_1, p_2, \dots, p_k are consecutive prime numbers and $p_k - p_1 = s$. For example, with $k = 4$, $s = 8$, $\{11, 13, 17, 19\}$ is a prime 4-tuple of distance 8.

Given an interval $[a, b]$, k , and s , your task is to write a program to find the number of prime k -tuples of distance s in the interval $[a, b]$.

Input

The input file consists of several data sets. The first line of the input file contains the number of data sets which is a positive integer and is not bigger than 20. The following lines describe the data sets.

For each data set, there is only one line containing 4 numbers, a , b , k and s ($a, b < 2 * 10^9$, $k < 10$, $s < 40$).

Output

For each test case, write in one line the numbers of prime k -tuples of distance s .

Sample Input

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1
100 200 4 8
```

Sample Output

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2
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