Problem F. Sumire

Input file: standard input
Output file: standard output

Calculate

$$\sum_{i=l}^{r} f^k(i, B, d)$$

where $f(x, B, d)$ means the number of times that digit d appears in the base-B form of x (ignoring leading zeros).

In this problem, we consider that $0^0 = 0$.

Input

The first line contains one integer T ($1 \le T \le 10^4$), denoting the number of test cases.

For each test case, the only line contains five integers k, B, d, l, r ($0 \le k \le 10^9$, $2 \le B \le 10^9$, $0 \le d < B$, $1 \le l \le r \le 10^{18}$), as the statement shows.

Output

For each test case, output an integer indicating the answer modulo $10^9 + 7$ in a single line.

Example

standard input	standard output
3 2 2 0 1 5 1 4 3 11 45 10 14 11 19 198	6 19 1049

Note

For the first case in the sample, the answer is

$$\begin{aligned}&\sum_{i=1}^{5} f^2(i, 2, 0)\\ &= 0^2 + 1^2 + 0^2 + 2^2 + 1^2\\ &= 6\end{aligned}$$