Problem B. Linear Congruential Generator

Input file:	*standard input*
Output file:	*standard output*
Time limit:	2 seconds
Memory limit:	256 mebibytes

You are given a generator defined by the recurrence relation

$$X_{n+1} = ((aX_n + c) \bmod m),$$

where $X = \{X_n\}_{n=0}^{\infty}$ is the generated sequence of pseudorandom values, and m, a, c, X_0 are integer constants which specify the generator.

Additionally, two integer intervals $[l_1, r_1]$ and $[l_2, r_2]$ are given. Please calculate

$$\sum_{i=l_1}^{r_1} \sum_{j=l_2}^{r_2} (X_i \bmod (X_j + 1))$$

Input

The input contains several test cases. The first line contains an integer T indicating the number of test cases. The following describes all test cases. For each test case:

The only line contains eight integers $m, a, c, X_0, l_1, r_1, l_2, r_2$.

- $1 \le T \le 10^5$
- $1 \le m \le 10^6$
- $0 \le a, c, X_0 < m$
- $0 \le l_1 \le r_1 \le 10^6$
- $0 \le l_2 \le r_2 \le 10^6$
- The sum of m in all test cases does not exceed 2×10^6.

Output

For each test case, output a line containing "`Case #x: y`" (without quotes), where `x` is the test case number starting from 1, and `y` is the answer to this test case.

Example

standard input	standard output
2 7 1 4 1 2 3 4 5 10 3 6 1 2 3 1 2	Case #1: 4 Case #2: 12

Note

In the first sample case, $\{X_n\}_{n=0}^{\infty} = \{1, 5, 2, 6, 3, 0, \ldots\}$.

In the second sample case, $\{X_n\}_{n=0}^{\infty} = \{1, 9, 3, 5, \ldots\}$.