RecXor

Time limit: *680 ms*

Memory limit: *264 MB*

A rectangle of dimensions $l \times h$ ($1 \leq l, h \leq 10^6$) is filled with numbers sequentially starting from number n ($1 \leq n \leq 10^9$) till the end of the rectangle. There is a second rectangle that fits inside the first rectangle and is defined by the end points of either of the diagonals, say d_1 and d_2 ($n \leq d1 \leq d2 < n + l * h$) which denote the numbers the diagonal starts from and ends at respectively. Your task is to find the `xor` of all the numbers that are not common to both of the rectangles. (Images below for better understanding.)

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70

l

h

Outer rectangle: 10 (*l*) x 7 *(h)*
Inner rectangle: 23*(d1)*, 48 *(d2)*

4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31
32	33	34	35	36	37	38

Outer rectangle: 7 x 5
Inner rectangle: 22, 27

Standard input

Input begins with a single number t $(1 \le t \le 100)$, which denotes the number of test cases.

Each test case begins with a line, which contains 5 space-separated integers l, h, n, d_1 and d_2.

Standard output

For each test case output a single number which is the `xor` of all the number that are not common to the rectangles.

Constraints and notes

- $1 \le t \le 100$
- $1 \le l, h \le 10^6$
- $1 \le n \le 10^9$
- $d_1 \le d_2$
- The sum of l for all the tests in a file is $\le 10^6$
- The sum of h for all the tests in a file is $\le 10^6$

Input	Output	Explanation
2 10 7 1 23 48 7 5 4 22 27	80 42	The test cases are for the images above. The `xor` of the uncommon numbers are 80 and 42 respectively.