Prefix of Suffixes

Input file:	`standard input`
Output file:	`standard output`
Time limit:	1 second
Memory limit:	128 megabytes

Ms. Wozzie has a variable-length array S. Initially S is empty, and the array will be manipulated N times, each time adding a number to the end of S.

She wants to check the current state of the array when she adds the i-th number S_i, so she will give you a pair of A_i, B_i at the same time, and wants you to output the current value of $\sum_{i=1}^{n} \sum_{j=i}^{i+z_i-1} A_j \times B_i$. Define z_i as the longest common prefix of $[S_i, \ldots, S_n]$ and $[S_1, \ldots, S_n]$ where n is the current length.

Recall that the longest common prefix of $[a_1, \ldots, a_n]$ and $[b_1, \ldots, b_m]$ is the largest L satisfying: $a_i = b_i, \forall 1 \leq i \leq L$.

To make sure you answered her question in real time, she will encrypt the number S_i she is currently adding backward through your last answer, the exact decryption is given in the input format.

Input

The first line contains an integer N ($2 \leq N \leq 3 \times 10^5$) indicating the number of operations.

For the next N lines, the i-th line contains three integers S'_i, A_i, B_i ($0 \leq S'_i < N, 1 \leq A_i, B_i \leq 1000$) representing the encrypted S_i and A_i, B_i.

For decryption: the value of S_i is $(S'_i + lastans) \mod N$, where $lastans$ denotes the last output answer. In particular, initially, $lastans = 0$.

Output

Output N lines, with the ith line representing the answer after the i-th operations on S.

Example

standard input	standard output
3 0 1 2 1 2 3 2 3 4	2 12 18