E - Mancala 2 Editorial by en_translator

Considering the operation of putting N balls in bulk, the procedure is rephrased as follows:

- Take out all the balls from box B_i and hold them in hand.
- Let X be the number of balls in hand. Put $\lfloor \frac{X}{N} \rfloor$ balls to each box.
- Let X be the number of balls remaining in hand. Put one ball into each of box $B_i + 1$ through box $B_i + X$.
  (If $B_i + X \geq N$, "box $B_i + 1$ through box $B_i + X$" means box $B_i + 1$ through box $N - 1$, and box 0 through box $B_i + X - N$.)

The operations that has to be applied on the array that represents the number of balls in each box are point update and segment addition. Using a data structure like a lazy segment tree, they can be processed in $O(\log N)$ time each, for a total of $O((M + N) \log N)$ time to solve the entire original problem.