Problem Tutorial: "Apples"

Subtask 1/2 — 25 points.

These subtasks can be solved using some simple formulas. If you try to simulate for both when $N = 2$ and when $N = 3$ manually, you can come up with really formula solution.

Subtask 3/4 — 75 points

The main difference between subtask 3 and 4 is the value of A_1. The subtask 3 is designed for people who found the correct solution, but couldn't multiply two long numbers.

Let's try simulate starting from the end when $N = 3$:

$\frac{1}{1} * x, \frac{1}{1} * x, \frac{1}{1} * x$
$\frac{1}{2} * x, \frac{1}{2} * x, \frac{4}{2} * x$
$\frac{1}{4} * x, \frac{7}{4} * x, \frac{4}{4} * x$
$\frac{13}{8} * x, \frac{7}{8} * x, \frac{4}{8} * x$
$\frac{13}{8} * x = A_1$ and by finding x you can find all initial values of an array. I hope you noticed a pattern, if not let's try to analyze what's going on: we are iterating from N to 1, and let i be the number of iterator. We divide every coefficient except i by 2. And we replace the coefficient of i by the new sum of coefficients. You can find out by yourself why it's true.

Because there will be at most $N = 50$ iterations, denominator will be no more than 2^{50}. You need to be careful when finding x, cause the multiplication might not fit in the limits of long long. Also don't the forget the case when there's no answer.