ML homework 2: Question 5

I don't agree with the answer provided by chatGPT, since as the question stated, what we knew about the sequence is that, "the first N − 1 terms of an integer sequence is generated from some polynomial of degree N", but this statement does not guarantee that the sequence is formed as:

$$(P(1), P(2), \ldots, P(N-1))$$

Therefore, if we let $P(i) = y_i$, we cannot plug in the points $(P(i), y_i)$ to derive the coefficients. For example, if we have the sequence as:

$$(P(2), P(3), \ldots, P(N))$$

Then we match the integer sequence $(y_1, y_2, \ldots, y_{N-1})$ to the two cases above, we will get different coefficients, thus resulting in different polynomials. Since the polynomial is not uniquely determined, we cannot guarantee what the N-th term will be.

Therefore, to predict the N-the term, we need more information telling how the sequence is defined (i.e We need to know the specific arguments of the polynomial that correspond to the sequence.)