CENG 223—Discrete Computational Structures

Q-2) {*20 points*}

Let $(f_0, f_1, f_2, \cdots, f_n, \cdots)$ be an infinite sequence where

$$f_n = \begin{cases} n+1, & \text{for } 0 \leq n \leq 2 \\ f_{n-1} + f_{n-2} + f_{n-3}, & \text{for } n \geq 3 \end{cases}$$

Prove by induction that $\forall n \in \mathbb{N},\ f_n \leq 2^n$