$$pop(n) = \begin{cases} 0, & \text{if } n = 0. \\ 1, & \text{if } n = 1. \\ \lfloor \frac{5 \cdot pop(n-1)}{2} \rfloor - pop(n-2), & \text{if } n \geq 2. \end{cases}$$

Base Cases:

$$pop(0) = 0, \qquad 2^{\text{n-1}} = 0$$

$$pop(1) = 1, \qquad 2^{0} = 1$$

$$pop(2) = 2, \qquad 2^{1} = 2$$

Assume $pop(n) = 2^{\text{n-1}}$
Show $pop(n+1) = 2^{\text{n}}$

$$pop(n+1) = \lfloor \frac{5 \cdot pop(n)}{2} \rfloor - pop(n-1)$$

$$pop(n+1) = \lfloor \frac{5 \cdot 2^{\text{n-1}}}{2} \rfloor - 2^{\text{n-2}}$$

$$5 \cdot 2^{\text{n-2}} - 2^{\text{n-2}}$$

$$4 \cdot 2^{\text{n-2}}$$

$$2^{\text{n}}$$