recurence relations

- Unwinding a recurence relation is working through until we can make a conclusion

- First, on a generic algorithm

$$G(n) = \begin{cases} d, & n=0 \\ G(n-1)+C, & n \geq 1 \end{cases}$$

$i=1$ $G(n) = G(n-1) + C$

$i=2$ $G(n) = (G(n-2) + C) + C$

        $G(n) = G(n-2) + 2C$

$i=3$ $G(n) = (G(n-3) + C) + 2C$

        $G(n) = G(n-3) + 3C$

$i=k$ $G(n) = G(n-k) + kC$

$k=n$ $G(n) = G(0) + nC$

        $G(n) = d + Cn \quad \in O(n)$

> **NOTE:** THIS IS NOT A PROOF. JUST A WELL EDUCATED GUESS

- We unwinded until we got to the base case

- This took k unwindings