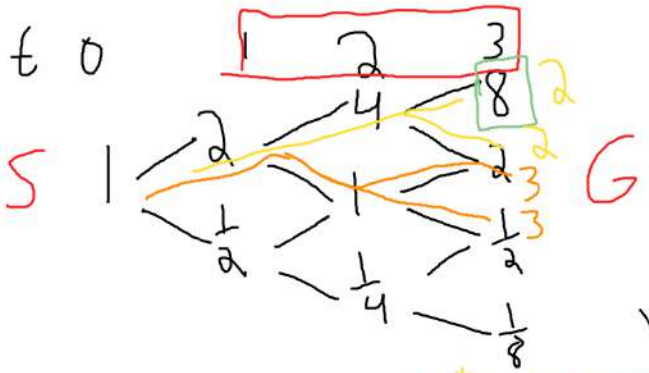
9d) $N=3$ $u=2$ $d=\frac{1}{2}$ $r=\frac{1}{4}$ $K=4$ American call option

$G_n = (S_n - K)^+$ $\quad V_n = \max\{G_n, \frac{1}{1+\frac{1}{4}}\tilde{E}[V_{n+1}]\}$

Consider $S_0 = 1$



$G_3(H,H,H) = 4$

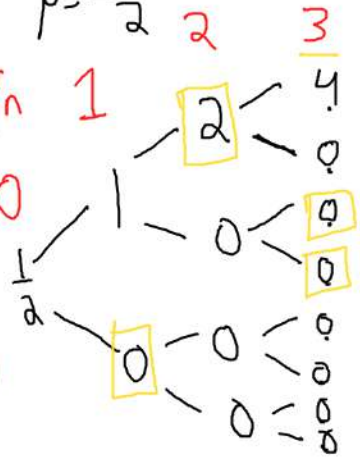
$G_n(\omega) = 0$ otherwise

$V_0^\sigma = \frac{1}{2}$

$V_0^{\sigma^*} = \max_\sigma V_0^\sigma$

$\sigma(H,H,\omega) = 2$
$\sigma(H,T,\omega) = 3$
$\sigma(T,\omega') = 1$

$\tilde{p} = \frac{1}{2}$



$\sigma^* = \min\{n \mid V_n = G_n\}$

σ another stopping time

σ^* is a stopping time

$V_0^{\sigma^*} \geq V_0^{\sigma}$

$V_0^{\sigma^*} = \max_{\sigma} V_0^{\sigma}$