Lecture 13: 08/28/22

Example 13.6:

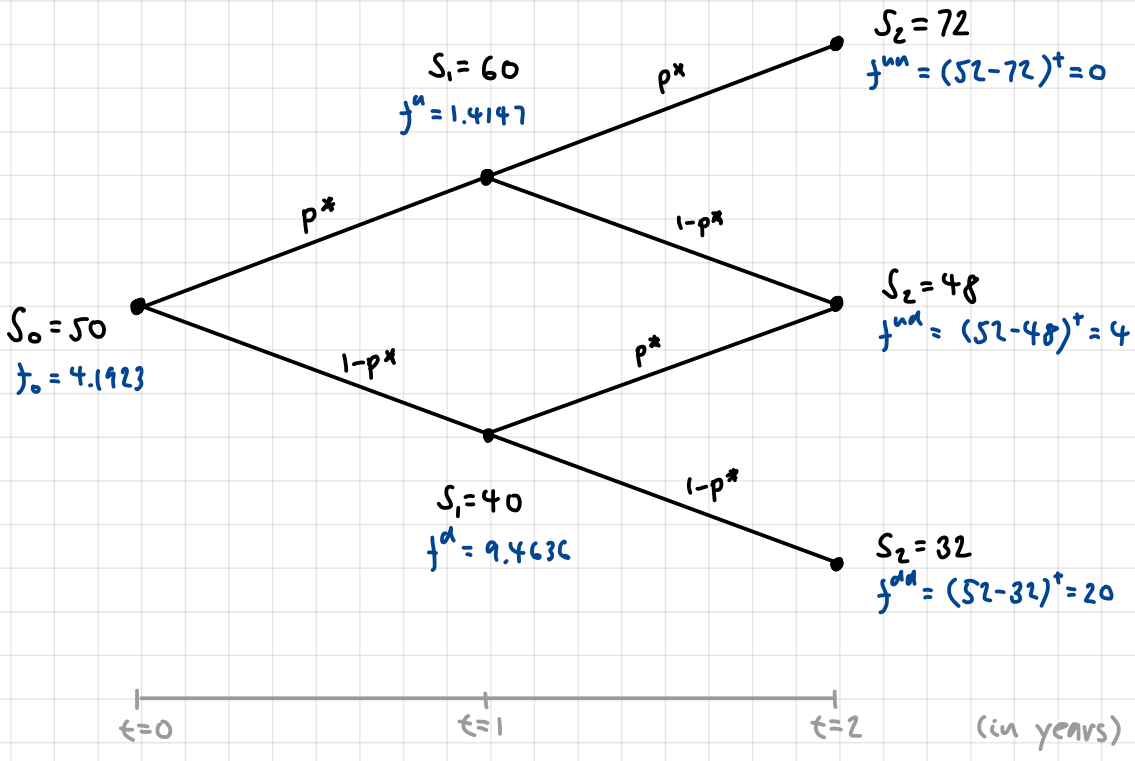
2-year European put option, $K = 52$, $S_0 = 50$, $r = 5\%$ p.a.

Assumption: Stock price increases/decreases by 20% each year

Here: $\Delta t = 1$ (years), $u = 1.2$, $d = 0.8$

$$p^* = \frac{e^{\Delta t \cdot r} - d}{u - d} = \frac{e^{0.05} - 0.8}{1.2 - 0.8} = 0.6282$$

$$1 - p^* = 0.3718$$



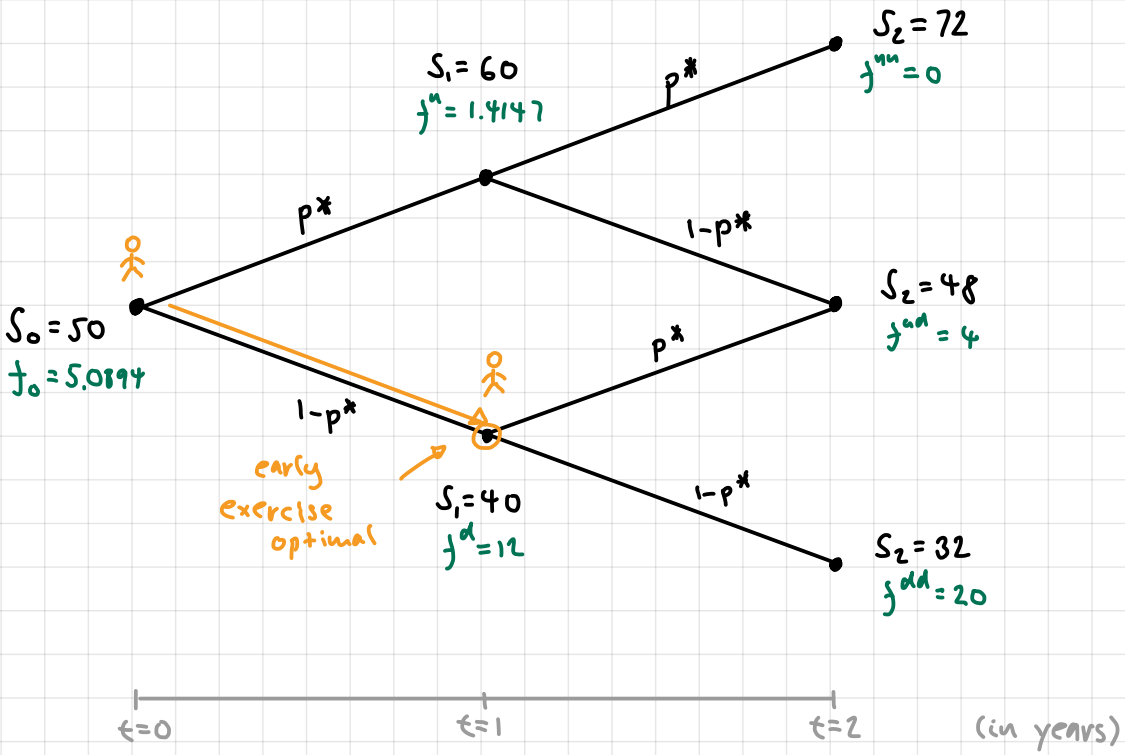
Example 13.7:

2-year American put option, $K = 52$, $S_0 = 50$, $r = 5\%$ p.a.

Assumption: Stock price increases/decreases by 20% each year

Here: $u = 1.2$, $d = 0.8$, $\Delta t = 1$ (in years), $r = 0.05$

$p^* = 0.6282$, $1 - p^* = 0.3718$



$t = 1$: $S_1 = 60$

intrinsic value: $(52-60)^+ = 0$

continuation value: $e^{-0.05}(p^* \, 0 + (1-p^*) \, 4) = 1.4147$

$S_1 = 40$

intrinsic value: $(52-40) = 12$

continuation value: $e^{-0.05}(p^* \, 4 + (1-p^*) \, 20) = 9.4636$

$t=0$: $S_0 = 50$

intrinsic value : $(52-50) = 2$

continuation value : $e^{-0.05}\left(p^* \, 1.4147 + (1-p^*)\, 12\right) = 5.0894$