QUESTION

Calculate the initial premium and the trading strategy for the asset/bond replicating portfolio for a European put option on the following data:

Strike \$50, Maturity 1 year, two intervals;
Continuously compounded annual risk-free rate 5.60%;
Volatility 20%; current price \$50

ANSWER

$k = 50,\ r = 0.056 \Rightarrow e^{r\delta t} = e^{0.056\times 0.5} = 1.02840,\ \sigma = 0.2,\ s_0 = 50$

$U = e^{\left[\left(0.056 - \frac{0.2^2}{2}\right)\times\frac{1}{2} + 0.2\sqrt{\frac{1}{2}}\right]} = 1.17283$

$D = e^{\left[\left(0.056 - \frac{0.2^2}{2}\right)\times\frac{1}{2} - 0.2\sqrt{\frac{1}{2}}\right]} = 0.88389$

Europut Summary: