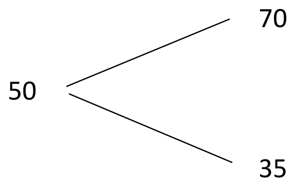
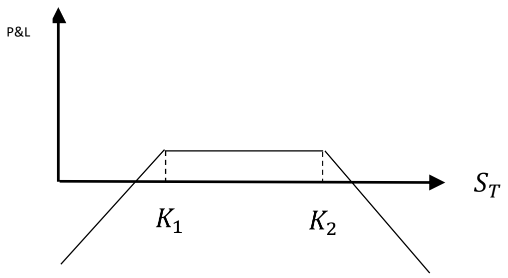
1. Please look at the following tree on stock price. Currently, the stock price is \$50, with equal probabilities to be \$70 and \$35. Let 1 year discount rate be 0.9, what is the forward price for the one year forward contract?

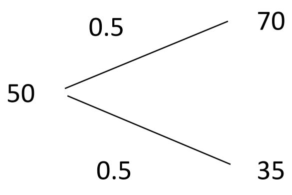


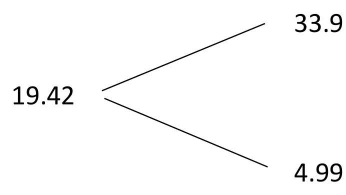
2. A stock price is currently 50\$. It is known that in 2 months it will be either \$53 or \$48. The risk-free interest rate is 10% per annum for simple compounding. What is the value of a 2-month European call option with a strike price of \$49? Use no arbitrage arguments.

3. How to replicate the portfolio using call options and put options?



4. Current stock price is \$50. If I have shorted 1 unit of call option, how to hedge it?
   The discount rate is 0.9





5. Consider the pricing of a forward contract on 2 million RMB. Let the spot exchange rate be 1 HKD=0.82 RMB, $€1 = 8.6631\text{HKD}$. One-year interest rate for RMB is 3.41%, for HKD 0.87% and for Euro 0.158%. What is the fair exchange rate for the one-year maturity forward contract between RMB and Euro

6. Let the current interest rate be 0. Currently, the stock price is \$50, and let's assume stock price dynamic follow model

$$log\frac{S_{t+\Delta t}}{S_t} = \mu\Delta t + \sigma\sqrt{\Delta t}\epsilon \ , \epsilon = \begin{cases} -1, & with\ probability\ 0.4 \\ 1, & with\ probability\ 0.6 \end{cases}$$

$$with\ \mu = 0.0523, \sigma = 0.1214$$

It is known that the price of a 2-month($\Delta t = \frac{2}{12} = \frac{1}{6}\ year$) European call option with a strike \$49 is \$2. Please provide strategy to earn riskless profit.

7. Use this list of Treasury bond prices as of May 15, 2001,

6's of 11/15/2001 101-25
6's of 5/15/2002 103-12
10's of 11/15/2002 110-21
to derive the price of the fourth bond 10's of 11/15/2002 ?

8. Using the information of question 7 to calculate the forward rates ?

9. An investor purchases the 4 3/4s of May 31, 2012 on May 31, 2010 after coupon payment, at the yield 0.7368%. Exactly six months later the investor sells the bond at that same yield. What is the price of the bond on the sale date and what is the investor's total return from the bond over those six months?

10. This is a list of Treasury bond prices as of May 15, 2001,
6's of 11/15/2001 101-25
6's of 5/15/2002 103-12
10's of 11/15/2002 110-21
At the same date, 6's of 11/15/2002 is quoted at 106-15. Is there any arbitrage opportunity? If yes, how?

11. The following table provide information of swap rates.

T2M	Coupon(%)
0.5	0.705%
1	0.875%
1.5	1.043%

Calculate forward rates.

12. Interest rate swap has two legs, fixed and float. If interest rate changes, which value of the two legs will be affected, why?