EC3333 Tutorial 6

*For this module, unless otherwise stated, the par value of the bond is assumed to be $1000.

1. A 30-year bond with a face value of $1000 has a coupon rate of 5.5%, with semiannual payments.
   a. What is the coupon payment for this bond?
   b. Draw the cash flows for the bond on a timeline.

2. Suppose a 10-year, $1000 bond with an 8% coupon rate and semiannual coupons is trading for a price of $1034.74.
   a. What is the bond's yield to maturity (expressed as an APR with semiannual compounding)? (You can use the Excel solver function to do this.)
   b. If the bond's yield to maturity changes to 9% APR, what will the bond's price be?

3. Suppose the current zero-coupon yield curve for risk-free bonds is as follows:

Maturity (years)	1	2	3	4	5
YTM	5.00%	5.50%	5.75%	5.95%	6.05%

   a. What is the price per $1000 face value of a two-year, zero-coupon, risk-free bond?
   b. What is the price per $1000 face value of a four-year, zero-coupon, risk-free bond?
   c. What is the risk-free interest rate for a five-year maturity?

4. The following table summarizes prices of various default-free, zero-coupon bonds (expressed as a percentage of face value):

Maturity (years)	1	2	3	4	5
Price (per $100 face value)	$95.51	$91.05	$86.38	$81.65	$76.51

   a. Compute the yield to maturity for each bond.
   b. Plot the zero-coupon yield curve (for the first five years).
   c. Is the yield curve upward sloping, downward sloping, or flat?

5. A bond with an annual coupon rate of 4.8%, sells for $970. What is the bond's current yield?

6. Consider an 8% coupon bond selling for $953.10 with 3 years until maturity making annual coupon payments. Calculate the yield to maturity of the bond. (You can use the excel solver function to do this.)

   Now assume that the interest rates in the next three years will be, with certainty, r_1=8%, r_2 = 10%, and r_3 = 12%, respectively. Calculate the realized compound yield of the bond (assuming that you reinvest all the coupon payments at the prevailing interest rates).

7. Consider a bond paying a coupon rate of 10% per year semiannually when the market interest rate is only 4% *per half-year*. The bond has 3 years until maturity.
   a. Find the bond's price today and 6 months from now after the next coupon is paid.
   b. What is the 6-month holding period return on the bond?

8. A 2-year bond with par value of $1,000 making annual coupon payments of $100 is priced at $1,000. What is the yield to maturity of the bond? What will be the realized compound yield to maturity if the 1-year interest rate next year turns out to be (a) 8%, (b) 10%, (c) 12% (assuming that you reinvest all the coupon payments at the prevailing interest rates)?

9. Consider a bond with a 10% coupon rate and with yield to maturity = 8%. If the bond's yield to maturity remains unchanged, then in one year, will the bond price be higher, lower, or unchanged? Why?

10. Suppose the bond has a current yield of 9% and a yield to maturity of 10%. Is the bond selling at a premium or at a discount? Why?