471/571 - HW4

due Mon, Nov 7th

Name: ____________________________

1. The problems in this section use the yield curve table. YearSpot Rate

Table 1:

year	spot rate
1	5.00%
2	4.50%
3	4.00%
4	4.00%
5	4.00%

   (a) A three year annual \$1000 par bond has a coupon rate of 4%. Use the yield curve above to find the price P and then use this price to find the yield to maturity.

   (b) Find the one year forward rate.

2. An investment pays 2000 in three years and 3000 at the end of the fourth year. An investor has purchased it to yield the annual rate $i = .075$. Find the Macaulay duration and the modified duration.

3. An annual corporate bond is priced to yield 7% annually and has a price of 940.29 and a Macaulay duration of $D = 6.5317$. Estimate the change in price if rates increase by 0.10%.

4. An investor has a portfolio containing \$1,000 worth of a three year bond with a modified duration of 2.7, \$4,000 worth of a five year bond with a modified duration of 4.6, and \$5,000 worth of a 6 year bond with a modified duration of 5.50. Find the modified duration of the entire portfolio.

5. You have a single liability of 200,000 payable at time 7. The valuation interest rate is $i = .06$. You wish to attempt to immunize this portfolio by buying two zero coupon bonds with maturities at times 4 and 10. Find the amounts of the two bonds, and verify that the portfolio is immunized.