**Individual problem set – do not work on with classmates. Submit each question in a separate worksheet in a single Excel file.**

1. Consider the auction for a new 10-year US Treasury note on November 13, 2013. The Treasury announced that this would be a $24 billion offering of a new November 15, 2023 note. Suppose that at the close of the auction, the NY Fed had received the following bids. Bids are provided in yield to maturity terms, and ranked from highest to lowest yields.

   - 3.05% $12.5 billion
   - 3% $11 billion
   - 2.95% $8 billion
   - 2.9% $6.5 billion
   - 2.85% $2.5 billion
   - 2.8% $6 billion
   - 2.75% $1 billion
   - 2.7% $4 billion
   - 2.65% $2 billion
   - 2.6% $1.5 billion
   - 2.55% $5 billion
   - 2.5% $5 billion
   - 2.45% $3 billion
   - Non-competitive $500 million

   (a) What yield to maturity will determine the note's coupon and value? Explain what bidders receive what amount of the auction.

   (b) How will the Treasury set the coupon rate on this note?

   (c) At what price will the Treasury sell these notes to the winning bidders?

2. Suppose that on Thursday, November 21, 2013, this note is selling for 99-11 (bid), 99-11+ (ask). It is trading on special in repo. The general collateral repo rate is 2%, and the specialness of this note is 150 basis points. Show the P&L of a trade that purchases $50 million par value of this note at the market on on Thursday, November 21, finances with repo, and sells the note on Monday December 30, 2013, when the market is 99-09+ – 99-10. Assume that the conditions in the repo market do not change over the period of the trade. Assume that there is no haircut in this market.

3. Suppose in the preceding question that this note did not trade on special during the holding period. What is the P&L in this case?

4. Suppose that there is a 2% haircut on this Treasury note in repo. The firm's cost of capital is 9% on a continuously-compounded basis. How is the P&L affected in both of the above situations (i.e., Questions 2 and 3)?