1) Suppose that the demand for loans depends on the annual interest rate charged \(r\), the annual fees charged \(F\), and the unemployment rate. Each loan is a $100,000, 30 year fixed APR mortgage.

\[
Q = 125 - 624r - .026F - 90.4UR
\]

The bank has a monthly fixed cost of $10,000 plus an annual variable cost (interest paid on deposits plus various administrative expenses equal to 5% of the loans created)

a) Suppose that the bank charges nothing in fees. Solve for the profit maximizing interest rate. What are the bank’s monthly profits?

b) Calculate the interest elasticity of loan demand at the profit maximizing point.

c) Now, suppose that the bank decides to charge $1200 per year in Fees. Calculate the bank’s profit maximizing interest rate and monthly profits.

d) How would (c) change if the Fee were a one time (i.e. closing costs)?

2) Suppose that bank tellers unite to form a labor union. As a result, wages paid to bank tellers rise dramatically.

a) Explain using diagrams how this would influence loan rates if the banking industry were monopolistic.

b) How would your answer change if the banking industry were perfectly competitive?

3) In late 1999, the threat of Y2K loomed large. Banks (along with everyone else) scrambled to make sure their computers were Y2K compliant. Assume that this expense is a fixed cost (i.e. not dependent on the size of the bank).

a) Explain using diagrams how this would impact loan rates in a monopolistic banking industry.

b) How would your answer change if the banking industry were perfectly competitive?

4) Suppose that you are the manager of a bank. You currently have $250,000 in Deposits ($200,000 in checking accounts, $50,000 in savings accounts), $15,000 in cash reserves, $160,000 in Short Term Commercial Loans and $100,000 in short term government securities. The reserve requirement is 5% of deposits and the minimum equity capital requirement is 4% of non-cash assets.

a) What is your current level of excess reserves? What is your current level of equity?

b) Suppose that the interest rate on Government securities is 3%, the interest rate charged to your outstanding loans is 7%, the interest paid on savings
accounts is 2% and checking accounts earn no interest. What is your profit? What is your return on assets? What is your return on equity?

c) Suppose that $10,000 is withdrawn from one of your checking accounts. How should you respond to this?

d) Suppose that a $30,000 loan defaults. How should you respond to this?

5) Suppose that you are the manager of a bank. Your bank currently has $100,000 worth of deposits in checking accounts, $50,000 in 1 yr. CDs (these will require a payout of $52,500 one year from now) and $20,000 in 2 year CDs (these will require a payout of $20,808 two years from now). You have $18,000 cash in the vault, $90,000 in loans due in 1 year (these will generate $94,500 in revenues in 1 year) and $80,000 in loans due in 2 years (these will generate $88,200 in two years). For simplicity, assume the interest rate is currently 5%. Set up the T-accounts for your bank and explain how each of the following events would affect your assets, liabilities and net worth?

e) One of your depositors closes his $10,000 checking account.
f) $20,000 of your 2-year loans defaults.
g) The market interest rate rises from 5% to 8%. (Note: to answer this, you will have to calculate your duration gap!)