For each assigned problem, assume your boss does not know anything about optimization or linear programming; you need to clearly address the implications of your analysis to his/her business. Use the Report Writing Sample (BB/Course Document/Report Writing.pdf) to write your report and answer questions:

2/5 of the points are in formulation, 1/5 points in results, and 2/6 points in analysis.

1. Formulate an LP model for the problem:
   a. Clearly define the decision variables
   b. Formulate each constraint, provide explanations if it is necessary.

2. Create a spreadsheet model for the problem and solve it using Excel@ Solver or PremSolver, include the following two reports in your report:
   a. Answer Report
   b. Sensitivity Report

3. What is the optimal solution and what is the optimal objective function value?
   a. OS is at:
   b. OFV is

4. Conduct sensitivity analysis for the OFCR (Objective Function Coefficient Range), Select one decision variable with Reduced Cost of zero (0):
   a. compute the lower limit for the objective function coefficient (OFCR) of this decision variable,
   b. Discuss, if the OFCR for this decision variable varies from the current level to the lower limit,
      i. is the optimal solution (OS) the same as before or changed?
      ii. What is the optimal OFV value at the lower limit?
   c. compute the upper limit for the objective function coefficient (OFCR) of this decision variable,
   d. Discuss, if the OFCR for this decision variable varies from the current level to the upper limit,
      i. is the optimal solution (OS) the same as before or changed?
      ii. What is the optimal OFV value at the upper limit?
   e. Compute the reduced cost for the decision variable with the equation given in the lecture note or on the page 148 of the text.

5. Conduct sensitivity analysis for the RHSR of one binding constraint.
   a. Compute the lower and upper limits for the RHSR of this binding constraint,
   b. Explain as the RHSR of this constraint varies within the given lower and upper limits,
      i. Is the feasible region the same as before or changed?
      ii. is the optimal solution (OS) the same as before or changed?
      iii. What is the optimal OFV value and how do you update the OFV without recomposing or resolving a new LP problem?

6. Conduct sensitivity analysis for the RHSR of one non binding constraint.
   a. Compute the lower and upper limits for the RHSR of this non binding constraint,
   b. Explain as the RHSR of this constraint varies,
      i. Is the feasible region the same as before or changed?
      ii. is the optimal solution (OS) the same as before or changed?
      iii. What is the optimal OFV value?