In IE 521, you have been or will be introduced to the concepts and techniques of linear programming (LP) and integer linear programming (ILP). One of the requirements of this course is that you work on a term project, and turn in a typewritten report. The problem should have the necessary characteristics that make it worthy of investigating and reporting as a term project. The problem identified should: (i) be sufficiently large in magnitude that it emulates a real situation, (ii) lends itself to be modeled and analyzed using LP or ILP to draw meaningful conclusions, (iii) offer nicer modeling twists, and (iv) be amenable to performing sensitivity analysis to determine how the solution to the model responds to the changes in model parameters. As this is an open-ended effort, you can select one of the two approaches described below to identify a problem, analyze, and present the results.

Approach 1
If at all possible, you are encouraged to identify a real problem. Those of you who have had an opportunity in the past to work in a manufacturing or service organization may have some idea as to the existence of such a problem. If so, you should take advantage of this situation.

Approach 2
If it is not possible to identify a real problem, you will need to do a literature search to identify a suitable case problem that represents a realistic situation. You should refer to the texts that are specifically devoted to case problems that can be modeled, analyzed, and solved using LP or ILP.

You can use LINDO for solving the problem formulated. LINDO is available on the network. Your report should include the following:

- The problem described should approximately have 15 to 20 decision variables and 7 to 10 constraints.
- The results obtained from performing sensitivity analysis of the model involving at least 3 model parameters.
- A copy of the real problem or case problem if it was obtained from published sources, and if necessary, copies of other selected articles/books that you have reviewed.

You must turn in your answers in report form. Your report must be structured around the following sections:

- Introduction – A comprehensive introduction to the problem investigated and the motivation for selecting it.
• **Problem Statement** - A description of the problem in its entirety in your own words.
• **Methodology** – A description of the various models/methods used to analyze the problem in the order in which it is presented in the problem statement.
• **Analysis** – A description of the analysis performed by employing the various models/methods described above.
• **Results** – A description of the results obtained for the problem. **Note:** Depending upon the nature of the problem, the sections on analysis and results can be combined into one section.
• **Conclusions** – Conclusions, while being succinct, must cover the entire scope of the problem.
• **Recommendations** – A description of the recommendations resulting from the investigation of the problem.

Use sections and subsections within a section as you deem appropriate in the write-up. The report must include a Table of Contents with page numbers of sections, subsections, and appendices listed. References, if used, must be cited in the body of the report and listed in the back under References. Make sure that your report is thorough and complete, addressing all of the issues above, including relevant discussions.

**Note:**

(i) You must get my approval by turning in a one-page summary of the work you are proposing to do for this term project, including a copy of the real-problem statement or case study problem. This should be done well in advance prior to writing up the report.