

Operations Research, Spring 2014

Case assignment 2

Instructor: Ling-Chieh Kung
Department of Information Management
National Taiwan University

Submission

The deadline of this homework is **1pm, March 31, 2014**. Please put a hard copy of the work into the instructor's mailbox on the first floor of the Management Building II by the due time. Submissions within 1pm to 2pm will get one letter grade lower as a penalty. Submissions after 2pm will not be accepted. Each team should submit just one report. The report should contain **at most six** A4 pages (including everything). Double-sided printing is certainly encouraged.

The case and tasks

In this assignment, you will write a new report for Case 4.3, the one you worked with in Case Assignment 1. The main reason to ask you to write a new report is to train you to write high-quality good reports. Given that most of you made some mistakes in Case Assignment 1, this is also a chance for you to correct those errors and get more concrete ideas about conducting Operations Research studies. Below I will list a few requirements and suggestions that you should follow in the new report:

1. OR-related:

- (a) Rule 101: Always follow the DFSI principle.
- (b) For Problems (a), (e), and (f), DO NOT impose integer constraints. With integer constraint, your models are not LPs.
- (c) In a typical OR study, you first formulate a model and then solve it. When you formulate an LP, the solution must be an outcome of that LP. In particular, fractional values are allowed for the solution. Therefore, in Problem (b) your solution is allowed to contain fractional values. In fact, for this case, the correct solution does contain fractional values. For Problem (b), DO NOT adjust these fractional values to integers.
- (d) For Problem (c), adjust your solution in Problem (b) to integers. Please note that your recommendation must be detailed enough so that one knows how to implement your recommendation. For this case, e.g., recommending to assign 120 students from area 1 to school 1 is not detailed enough, because $120 \times 0.32 = 38.4$ and that means one cannot implement your plan. In other words, you must make sure that in your recommendation, the number of students you assign from each area to each school must be an integer for each grade.
- (e) In general, when you are asked to "solve a model" or "write down an optimal solution", you must report the values of all decision variables, not just the objective value.
- (f) When you formulate a mathematical model in a report, explanations for constraints and the objective functions are needed. Definitions of decision variables, of course, are always the most important.
- (g) Writing a compact formulation is typically better writing down all the numbers.
- (h) For Problems (e) and (f), you must indicate how your models are different from the one in Problem (a).

2. Format-related:

- (a) Write either in English or Chinese, but not both.
- (b) Put your names and student IDs in the first page.
- (c) It is not helpful to put a problem description or data, especially when the page limit is strict.

- (d) Using a table to summarize a solution is good. However, some words for explanations are always needed.
- (e) Instead of pasting your excel data to your report, you should organize the data into a word table. In short, you need to make the table in a good format.
- (f) Add page numbers.

Lastly, the objective values for the correct solutions to Problems (b) and (d) are around \$555,555 and \$420,000, respectively.

Grading

Case assignments, including this one, are graded with letter grades. The correctness and completeness of your answers and the organization and format of your report together decide whether you get A, B, C, or D.

Format

For case assignments, we put a higher standard on the how formal your report is. Some general guidelines are also posted online. Please do not forget that you have a team to work on one problem: Discuss together for the whole problem instead of work individually! Then try your best to write a formal and complete report.