

Operations Research, Spring 2016

Case Assignment 2

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In this assignment, we will consider the agent scheduling problem described in Case Assignment 1 again.

1 The task for this assignment

1. (30 points) Let's focus on agent scheduling in the boarding division in this problem. Please ignore the no-consecutive-shift constraint.
 - (a) (10 points) Formulate a linear program that can decide whether it is possible to fulfill all demands without hiring any new agent. DO NOT try to solve this problem.
 - (b) (10 points) Suppose that both full-time and part-time agents may be hired. Formulate a linear program that can minimize the total wage while satisfying all demands. Write down ONLY the mathematical formulation. DO NOT solve the problem.
 - (c) (10 points) Continue from Part (b). Write an AMPL model file and an AMPL data file for the linear program. Decouple the data from the model. Solve the problem and report an optimal agent hiring plan and schedule. Do not forget to interpret your solution and make a managerial suggestion.
2. (50 points) Let's focus on agent scheduling in the check-in division in this problem. Please ignore the no-consecutive-shift constraint.
 - (a) (15 points) Do Part (a) in Problem 1.
 - (b) (15 points) Do Part (b) in Problem 1.
 - (c) (20 points) Do Part (c) in Problem 1.
3. (20 points; 10 points each) Let's focus on agent scheduling in the boarding division in this problem. Please take the no-consecutive-shift constraint into consideration.
 - (a) Do Part (b) in Problem 1.
 - (b) Do Part (c) in Problem 1.

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2 Submission rules

- **Things to submit.** Please put a hard copy of the work into the instructor's mailbox on the first floor of the Management Building 2. Limit your report to six pages, including everything. Please also send all your programs (including AMPL model/data files and other programs, if any) electronically to the TA Johnny Chen. Name your file names appropriately. Indicate the file names in the report.
- **Deadline.** The deadline of this homework (for both the report and files) is 2:00 pm, April 6 (Wednesday), 2016. Works submitted between 2:00 pm and 3:00 pm will get 10 points deducted as a penalty. Submissions later than 3:00 pm will not be accepted.
- **Teams.** Students may form teams to work on this case study. Each team can have at most four students. Each team should submit only one report. All team members must sign on the first page of the hard copy of the report. If one does not sign, she/he will get 10 points off as a penalty.