

# Operations Research, Spring 2014

## Final Project

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**Note.** In the final project, you are invited to conduct an OR study on a real problem. You are expected to find your own problem, formulate an model that describes the problem, collect relevant data, solve the model, and make interpretations and suggestions from your solutions. What we really want to see are (1) how you apply OR to solve real problems, (2) how you select a suitable topic and appropriate methods, and (3) how you present your ideas and results. Good luck and enjoy!

### 1 Teams

Please form a team of six to nine people for this project. One student cannot participate in two teams.

### 2 Tasks

In this project, each team needs to apply OR techniques to solve a real problem until helpful suggestions are made or insightful implications are found. The topic will be chosen by team members. While there is no restriction on the topic, it will be best that the topic is (1) relevant to our daily life and (2) can be understood easily by everyone in class.

While you are choosing your own topic, you are welcome to discuss with the instructor to ensure that the topic is fine. Below are two example topics that were studied by former students:

1. (The best way to eat at McDonald's) Facing all the meal options in McDonald's, how to spend as little money as possible while getting enough (or not too many) calories and eating some favorite foods? Do not forget that a best meal always contains various kinds of foods. Moreover, how would you model those special meals with price promotions?
2. (The best midnight meal combination at girls' dorm) Given fixed budgets and limited supplies, how to find the best midnight meal combination to serve students? While minimizing calories is still an issue, the traveling distances from food suppliers to the dorm is also an issue.
3. (Route selection for towing away bicycles in NTU) How to minimize the traveling distance of the towing truck while towing as many regulation-violating bicycles? Given the towing uncles' strategy, how will students response in parking their bicycles (hopefully legally)?

As this is a project, most details should be left for you to decide. However, you are more than welcome to discuss your ideas with me. Please do not work on the above topics: Find your own!

### 3 Technical requirements

For this project, each team needs to write a proposal, make a presentation, and write a report.

1. Proposal: A proposal describes the problem you want to study and the tentative methods you want to apply. A hard copy should be submitted to the instructor's mailbox by **1pm, May 15, 2014**. Please indicate each team member's name and student ID on your proposal. Limit your proposal to **two pages** (including everything), i.e., two single-sided sheets (not recommended) or one double-sided sheet (recommended).

2. Presentation:

- (a) Each team needs to do an oral presentation for around twenty minutes on **June 12, 2014**. You may decide the number of speakers by yourself (at least one, of course). Speakers are encouraged to present in English, though Chinese is still allowed.
- (b) **All team members** should show up in class during the presentation of your team.<sup>1</sup> The one who is absent will get **zero** point for presentation.

3. Report:

- (a) In your report, describe your problem, formulation, data, solutions, and suggestions.
- (b) Limit your report to **twelve pages**, excluding the cover page. This means twelve single-sided sheets (not recommended) or six double-sided sheets (recommended).
- (c) Submit a **hard copy** of your report into the instructor's mailbox AND e-mail the **electronic files** of your report and slides to the instructor by **11:59pm, June 12, 2014**. Submissions on June 13 will get one letter grade lower as a penalty. Submissions afterwards are not accepted.

## 4 Grading policy

Below we describe how your works will be graded:

- 1. Proposal: It will not be graded. Please still submit it for us to know how students form teams. More importantly, you may get some feedback from the instructor if you submit a proposal.
- 2. Presentation: According to the quality of your presentation, a letter grade will given to you by the instructor AND students. Grades from all students will be averaged (A for 4, B for 3, etc.) and counts for 60% of the grade; the grade from the instructor counts for 40%.  
**Note.** The key is to choose a good topic, give a clear and interesting talk, and generate useful conclusions.
- 3. Report: According to the quality of your written report, the instructor will give you a letter grade (with + and -).  
**Note.** The key is to apply appropriate methods correctly and write a formal report.
- 4. Peer review: Each student will give a letter grade based on the contribution of each other teammate. Excluding the highest and lowest grades, the remaining grades will be averaged.  
**Note.** The key is to work hard!

The three average grades for presentation, report, and peer review are then averaged with weights 50%, 35%, and 15%. A final letter grade (with + and -) will then be determined based on the standard conversion rule.

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<sup>1</sup>Unless one has completed a formal petition for be absent in class due to sickness, duty, etc.