

Operations Research, Spring 2013

Project 3

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Note. As this is a project instead of homework, the expectation on your performance is higher than that for homework. As you will see, the difficulty of the tasks in this project is not very high (actually, you are the one that decided what to do). So what we really care about is (1) how you applied Operations Research to solve real problems, (2) how you select a suitable topic and suitable methods, and (3) how you present your ideas and results. Besides of getting correct and insightful results, try your best to make your report and oral presentation precise, concise, pretty, and easy to understand.

1 Teams

Please form a group of five to eight people for this project. One student cannot participate in two teams. You do not need to submit a team member list to the instructor before the due date. However, please indicate each team member's name and student ID on your report.

2 Tasks

In this project, each team needs to apply Operations Research techniques to solve a real problem. You are expected to go through the entire process, including selecting a decision problem, formulating it, collecting relevant data, solving it, and delivering helpful suggestions. In short, you need to apply what you have learned in this semester. 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. For example, it is probably not a very good idea to study the optimal way of controlling a vehicle running on ice.

If you want to choose your own topic, you are welcome to discuss with me to ensure that the topic is fine. Below are two example topics that are suitable for this project.

1. (The best team in CPBL) If you have the power to buy any player in the Chinese Professional Baseball League, how should you form your team to win the Championship? Given that you have only a fixed budget, should you spend most of the money on a few superstars or allocate the budget equally to many average players? Should you emphasize on pitchers or batters? How much money do you need?
2. (U-bikes at the MRT stations) Every morning, many people ride U-bikes from the Gong-Guan MRT station to the front door of NTUST. In a short time, there will be no U-bike at the MRT station and no empty slots at NTUST. If you may "store" some U-bikes around the MRT station, how many will you store? If you may use a truck to send U-bikes back to the MRT station, how frequent should you do this?

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. You may work one of the topics listed above or choose your own topic. In general, after you listed your research questions and before you start to collect data, it is a good idea to let me know your questions first so that I can provide my feedback.

3 Technical requirements

1. Limit your report to **twenty pages**, excluding the cover page. This means twenty single-sided sheets (not recommended) or ten double-sided sheets (recommended).
2. 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 13th**, 2012. Submissions after the due time or to a wrong place will not be accepted.
3. Each team needs to do an oral presentation for around fifteen minutes. You may decide the number of speakers by yourself (at least one, of course). Speakers will get extra bonus. Speakers who present in understandable English will get more extra bonus.
4. **All team members** must show up in class during the presentation of your team.¹ Otherwise, that team cannot present and **all team members** of that team will get **zero** point for presentation.

4 Grading policy

We will grade your project 3 from the following four perspectives:

1. Overall (30%): We expect you to choose an interesting topic, ask meaningful and relevant research questions, correct formulate your problems, solve your problems in a right way, and obtain insightful results from your study.
2. Report (25%): We expect your report to be well-organized. It should present your ideas, methods, and results clearly, precisely, and concisely.
3. Oral presentation (30%): How good the presentation is will be judged by both students and the instructor. All students are expected to grade all presentations (one grade for one team). Grades inside the 15th and 85th percentiles will be averaged to become the grades for the presentation from students. The instructor will also grade presentations. Grades from students and the instructor will then be weighted averaged.
4. Oral presentation bonus (10%): Presenters can get bonus based on their performance and English speaking fluency.
5. Peer review (15%): All students are expected to evaluate her/his teammates' contribution. Grades except the lowest and the highest will be averaged to become one's contribution grade.

Besides the bonus for presenters and the peer review grades, all team members get the same grades in other items. If your raw score is higher than 100, it will be treated as 100.

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