Linear Algebra and its Applications, Fall 2013
Final Project

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1   General information

1. For the final project, students need to apply what they learn in this course to write a research paper for a self-selected topic.

2. There is no restriction on the research topic and scope. However, to make sure that your topic is "good", i.e., challenging enough while doable, you are strongly encouraged to discuss with the instructor about your project.

3. Students should form teams to do the project. Each team should have **_two to four_** students. The standard for evaluating the project will not be affected by the number of students in a team.

4. Each team needs to submit **_one report_** and give **_one presentation_**. Students need to make **_slides_** for their project presentations. Reports and slides should be submitted **_electronically_** by sending the files to the instructor's e-mail box. Detailed instructions for the reports and presentations are provided below.

5. **_Important dates_**:

    (a) Team formation:

        i. Students should inform the instructor about team formation by sending an e-mail to the instructor with the names and student IDs of the students in the team.
        ii. Deadline: 23:59pm, December 2, 2013.
        iii. Students who do not inform the instructor about team formation by the deadline will be randomly grouped into teams.

    (b) Project:

        i. Presentation: in class, December 31, 2013.
        ii. Slides due time: 8:00am, December 31, 2013.
        iii. Reports due time: 23:59pm, December 31, 2013.[1]

2   Project

1. Each team should write a research paper as their final project. In the paper, one should introduce the problem, list related works (if any), formulate the model (with Linear Algebra!) that describes the problem, solve your problem, and finally make interpretations about the solutions.

2. Typically, in a research people do one of the following two things: Developing a solution for a nontrivial task, or finding explanations for a nontrivial phenomenon. The former is more like an engineering-style study while the latter is more like a science-style study. You may do either one, or do something else that is interesting to you.

3. When it is necessary, you may need to implement something to complete your project. For example, you may need to write a program.

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[1] And then you may count down and say "Happy New Year!!" XD

4. You are allowed to use knowledge you learn outside this course. However, somewhere you must apply what you learn in this course. You are particularly encouraged to study a problem in your own domain, not in the instructor's. However, please provide a basic introduction for your problem so that other students and the instructor may understand your work.

5. The solution technique needs not to be hard. For example, as long as they mean something, you may simply look for the eigenvalues of a matrix that appears in your problem. You are not expected to develop new methodology (but if you do so, that is definitely exciting); instead, you are expected to study new problems or develop new applications.

6. Doing a literature review for your project is a plus. However, it is not required.

7. There is no page limit for the project report.

8. Each team needs to do a presentation for the final project. The presentation should be given with slides. The length of each presentation will be determined after the number of teams are fixed. Related information will be announced in class on December 3, 2013.

3   Grading and others

1. The project will be graded with the following grades breakdown:

    (a) 60% for project quality, including the selection of the topic, the completeness of the analysis, and the contribution of the findings.

    (b) 20% for project report.

    (c) 20% for project presentation.

2. You may write your report in English or Chinese. If you plan to write your report in English, please try your best to minimize grammatical errors and maximize the readability of your report. Actually the same thing also applies to reports written in Chinese.

3. In any case, please *type* your report (with computers) instead of *writing* your report (with hands).

4. You may do your presentations in English or Chinese.

5. As a researcher, you should write professional reports. Some general suggestions for formatting your report can be found in the accompanied file "suggestions for formatting your reports" on the course website.