Project of EIE 3280:
Networks: Technology, Economics, and Society

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Summer 2019

Project! Exciting Project! A platform to show your imagination, creativity, and team work!

Here we provide a list of suggested topics for the course project. The topic descriptions are meant to be **open-ended**. So please use your imagination and enrich the description based on your own interests. Some of the topics are related to later chapters, and you can read in advance. **You are strongly encouraged to suggest your own topics** (subject to our approval, details below).

The deadline for submitting your group's preference is **June 26 (Wednesday) 5pm.** For detailed submission, see "**What to do next?**" later in the document.

How to select the project topic?

Each group has two choices:

1. **Bid up to three projects from the list of suggested projects.**
   - Each group has a total budget of 10 tokens, and the bid for each project needs to be a positive integer. The total bids for all projects should be no more than 10. For example, the bid can be in the following form: **(Project 1: 4 tokens; Project 4: 3 tokens; Project 10: 3 tokens)**. You may also bid in the following format: **(Project 1: 7 tokens; Project 10: 2 tokens; no third project)**. In the second case, you only bid for 2 projects without fully utilizing all 10 tokens (and it is ok).
   - The projects will be allocated based on the *Generalized Second Price Auction* that we learnt in Chapter 2. A project will be allocated to the group with the highest bid for this project (**with ties broken randomly, so there is no need to submit your bid much earlier than the deadline**), and the winner will pay the second highest bid for that project (with a minimum of 0 token if no one else bids for that project). If your group does not win any of the three projects you bid, then you will be randomly matched to one of the remaining projects with a payment of 0 token.

2. **Propose your own project topic.**
   - Your proposed topic needs to be **significantly different from all suggested topics**, and it needs to be related to at least one topic of this course.
   - If we approve your topic, then you will receive a bonus between 0-10 tokens, depending on the level of innovation and difficulty. If your proposal does not reach the quality standard in our mind, you will be randomly matched to one of the suggested topics with 0 payment.

How do we grade the project?

It includes two parts.

1. **Overall Project Grade:** Your project's overall grade will be Raw Grading x Bidding Coefficient. The Raw Grading will be purely based on the quality of the project result (including in-class presentation and project report). For the Bidding Coefficient, it will be calculated based on the

auction result. For example, if you win a project and pay 5 tokens, then Bidding Coefficient = (1-PaymentToken/100) = (1-5/100) = 0.95. If you receive some token due to an excellent self-proposed topic, then it will be counted as negative payment in the above calculation, hence will lead to a Bidding Coefficient larger than 1.

2. **Intra-Group Peer Evaluation:** The final project grade of an individual group member will also depend on the intra-group peer evaluation. Each group member will be asked to provide a peer evaluation to the other group members in terms of percentage of contributions (excluding his/her own contribution), **with the total percentage equal to 100%**. For example, an intra-group evaluation of a Student B in a three-person group can be **(Student A: 40%; Student B: SELF; Student C: 60%)**. After the evaluation, each group member will receive two peer evaluations (from his/her four group mates), and his/her final project grade will be Overall Project Grade x Summation of Peer Evaluations. If there are significant

What to do next?

Each group selects a group leader, and that group leader emails the group's project choice **(one email per group) to Ms. Mickey Ma (mickeyma [at] cuhk.edu.cn) by June 26 (Wednesday) 5pm, with the email title "[EIE3280] Project". Please include the information of all group members (student IDs and Full Names) and copy this email to all group members.**

If you try to bid one or more suggested topics, please email your bids according to the **recommended format on the first page**. If you self-propose a topic, please include a project abstract (no more than 400 words). **If we do not receive your group's submission by the deadline, we will randomly assign your group a topic, and your group's payment will be 10 tokens (as the penalty).**

No.	Suggested Project Ideas
1	**Search Engine Optimization** Develop methods to increase your homepage's importance score, based on your knowledge of Google's page ranking algorithm. Compare several methods and find out which ones are most effective. Demonstrate the result through actual data.
2	**Ranking of Multimedia Search** Searching through images, audios, and video clips requires very different ways of indexing, storing, and ranking. How does Google/Baidu rank multimedia contents? Any suggestions to further improve the current ranking practice?
3	**Algorithms Winning the Netflix Prize** Check the Netflix Prize website http://www.netflixprize.com and find the winning teams' algorithms. Simulate one of these algorithms, compare it with the Neighborhood method, and explain where the key improvement comes from.
4	**Hotel Ranking on Ctrip** How does Ctrip suggest and rank hotels when users search a destination or search a particular hotel? Is Ctrip's rating practice trustworthy? You may consider various factors including price, destination, hotel star rating, distance from scenic spots, commonality between hotels, popularity, user rating, comments, and favour, hotel facilities and property age.

5	**How Do Social Networks Recommend Friends?** In many social networks, such as Facebook and LinkedIn, the platform regularly recommends friends for the users. What are the main reasons behind these recommendations, and are they very effective? Can you design a recommendation algorithm to capture the key factors?
6	**Create a viral video** Create a video of your own and make it viral on a social platform.
7	**Interdisciplinary applications of social networking** Social network is not only the connection of people, but also a powerful research tool which has been applied in many fields, e.g. engineering, economics, finance, politics, arts, and history. For example, Harvard researchers modeled the letter communications among scientists in Europe to study the knowledge transfer history. Reuters constructed the leadership network of political leaders to explore political movements in China. Find one such example and provide your own analysis.
8	**Combat rumors on social networks** Design a mechanism to reduce the chance for rumors to speed on social networks.