Operations Research

Fall 2017

Project Instruction

Purpose: Apply the methodologies of operations research to the "real problem" and support the decision making process.

Guideline: This project has 40% in your final grade. This is a team-work project (Individual project is allowed). Each team has at most four members. The project should follow the project instruction and write a brief project report (around 5 pages including figure and table) and give a 10mins presentation (around 12 slides) on Jan. 12, 2018. The report violating the project instruction is not accepted. Please "zip" project report (eg. Word), slides (eg. PPT), dataset (eg. Excel) and code (eg. Python + Gurobi) to cylee@ncku.edu.tw before **5pm, Jan. 19, 2018**. Late project report is not accepted.

Content and Format:

1. Title

Give a title to your project work, eg: Shortest Path Problem from NCKU to Anping Castle, Apple Product-mix Decision, Queueing System Improvement in McDonald, etc.

2. Background and Motivation

2.1 Motivation: Describe your motivation and why you choose this topic. Why this problem/decision is significant to our society or important to us.

2.2 Background: Describe the problem background or context. eg: how/why the shortest path problem benefits us? how the Apple product change the world?

2.3 Problem Definition: Give one or two sentence to define your problem clearly. eg: This study finds the shortest path to from NCKU to Anping Castle considering the traffic flow. This study finds the best product-mix of iPod, iPad, and iPhone under the limited budget.

3. Methodology

What is the method you choose to analyze your work? eg: Linear Programming, Transportation Problem, Assignment Problem, Network Optimization, Markov

Chain, Queueing Theory, etc. Why you choose this method? Is this method fit your problem? (Method Justification)

4. Data Collection and Analysis Result

4.1 Data Collection: Describe the data source and how your get this data. If you don't have/use real data set, please justify your data.

4.2 Model Formulation: Give a graph diagram (eg: network graph) or mathematical formulation (LP model) to illustrate your problem.

4.3 Analysis: Use the method introduced in session 3 to analyze your work. Show all your calculation in detail (eg: Python + Gurobi Code). What's the result or the best alternative you suggest?

5. Conclusion

Summarize and guide the future research of your project work.

Finally, please remember this project is to let you know how to apply the knowledge you learn in class to real-world setting. **The original or innovative idea is encouraged**. You will learn how to find an **interesting and significant** problem from our society, and rebuild the real problem to the quantifiable and analyzable problem in this project. Show your best work and good luck.

Merry Christmas and Happy New Year!!

Thank you for joining my class and wish you have a wonderful New Year 2018!