Operations Research Applications and Implementation

Spring 2021

Term Project Instruction

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

Guideline: This project has **60%** (including 15% Github article) in your final grade. The project "MUST" implement a system or demo the analysis or optimization solver in the final presentation. The project should follow the project instruction and **write a tutorial report in Github** (including analysis flow, figure and table). The report violating the project instruction is not accepted. Each team should give a project English presentation (15 slides for 12 minutes) with details on **Jun. 22, 2021** in class (on-line presentation). **Please email your zip file with slide (PPT), Github linkage, code, and data with file name: "ORA_Project_NAME1_NAME2.zip"** to NTU COOL before **5pm, Jun. 25, 2021**. Late project report is not accepted.

Content and Format of Slide Presentation

1. Title

Give a title to your project work, eg: stochastic programming for vendor selection and order allocation under uncertain on-time-delivery.

2. Background and Motivation

2.1 Motivation: Describe your motivation. 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 capacity planning benefits us? how the material requirement planning changes the world?

2.3 Problem Definition: Give one or two sentence to define your problem clearly. eg: This study proposes stochastic programming model to minimize total cost of capacity allocation for demand fulfillment in supply chain network.

3. Methodology

What is the uncertain factor in your problem? How does it significantly affect your result? What is the method you choose to analyze your work? eg: linear programming, reinforcement learning, MODA, stochastic programming, 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, you may apply data generating process (DGP) or simulation. Please justify your dataset.

4.2 Analysis: Use the method introduced in session 3 to analyze your work. Show all your calculation in detail. Please use **table** or **figure** to illustrate your numerical result.

4.3 Result: What's the result or the best alternative you suggest?

5. Conclusion

Summarize and conclude your project work.

Presentation

Introduce your project in 12 mins. The number of slides should not be more than 20. For example, you may follow the outline above. Please present your topics clearly and slowly, just like "tell a story". Please introduce your idea and methodology in academic way and promote the "product" you generated. Please do more practice and have a rehearsal before your presentation and ensure that all the audience can catch your idea "easily". **Of course, it is an English presentation.**

Finally, please remember this project is to let you know how to "implement" the ideas from the class you learn and how to apply the ORA methodology to real applications. Your "innovative" idea is encouraged. Note that you need to write down all your works in details (equations, tables, figures). Show your best work and good luck.

Thank you for joining my class and wish you have a fantastic summer vacation!