MATHS 3025 - Professional Practice III
Group Project

Semester 1, 2021

Background and Goal

You are part of a team at an Australian car company called Haldon. The company is looking to buy one of three new factories, in Australia, Canada, or Indonesia. A company manager, Sarah Simmons, has asked your team to make a recommendation on which factory to buy. Sarah is your boss's boss, and has about 250 people working under her. You may have met once, briefly, at an introduction event for new employees.

Sarah has given you a series of handouts containing relevant information, available on MyUni in the Group Project Hub. Imagine Sarah has sent you an email, and the handouts are attachments she has included to help your team get started. The information contained in the handouts should form the basis of your team's final recommendation. You are encouraged to conduct further research to help improve your team's recommendation. You should use reliable sources, and make sure any external sources you use are properly attributed/referenced. If you find information that contradicts information contained in the handouts, always assume the handouts are correct.

Method

You may use any methods you want to provide the best possible recommendation. Two specific methods you should use are *linear optimisation* and a *decision–making framework*.

Linear Optimisation

The project contains a linear optimisation problem. You can use data from the handouts to help you perform the necessary computations and calculations. One of the handouts also contains a suggestion that another Haldon

employee may be able to help your team with the linear optimisation problem.

Your workshop tutor will not help you with any maths or coding contained in the project. In the workplace, you may find that you are the best maths or programming expert in your team, and so you will be expected to solve any technical problems yourself. The handouts contain some useful notes on relevant mathematics for formulating and solving linear optimisation problems. You may post questions on Piazza, but you may only receive answers that relate to the scope of the assignment/project.

Decision-Making Framework

Use the decision-making framework from Steve Begg's lecture (lecture 8) to provide your group's recommendation. Additional notes on decision making are available on MyUni in the Group Project Hub. To simplfy matters, you don't need to worry about taxes in any of the three countries. Also, while uncertainty often forms a very important part of decision-making in practice, for this project, you may assume there is no uncertainty in the information contained in the handouts. Equivalently, as Steve explains, you can use *expected values* if there is uncertainty, and you may assume that every number you are given is the expected value. The relevant content from Steve's lecture includes:

- framing the decision,
- the payoff matrix, and
- net present value.

Things to Consider

Your Goal and Your Audience

Haldon managers, including Sarah Simmons, will make the decision on which factory to buy. Your team is only providing a recommendation. Your goal is to clearly explain which factory you are recommending and why, so that management can make their decision with confidence. Throughout your presentaton and report, focus on who your audience is, and what information they care about.

The Haldon managers who will read your report and view your presentation are not mathematicians or computer scientists. This means they won't understand complex formulae, and won't know what a Matlab script is or does. You should still aim to be as clear as possible about what your team

did, using non-technical language. The managers will need to know what information and methods you used, so they can understand the reasoning behind your recommendation. For example, you shouldn't explain the mathematical details behind linear optimisation, but you should explain the ideas behind it, what information goes in, and what output you generated. If you are unsure of this yourself, you should ask your other team members to explain it to you (each team should have at least one member who has completed Maths IA or Maths for Data Science I).

Critical, Creative, and Independent Thinking

In a University assignment, what you are expected to do is generally very clear. You'll understand what resources to use (e.g., lecture notes), and what boundary conditions there are. In the workplace, this is rarely the case. The resources and boundary conditions will often be poorly defined, and the emphasis will be on achieving the best possible result. In the workplace, if you tell your boss or manager "I didn't look at X because you didn't tell me to look at X", they won't be impressed. On the other hand, if you tell them, "You asked me to look at Y and Z, but I did some research and found out that X is important too. Here's why ...", they'll be much happier.

For this project, the handouts you have received are only a starting point. Where else your group goes - what else they research and report on - is up to you. You can earn marks in your report for showing creativity and critical thinking. Don't be afraid to think '"outside the box", and to look for additional relevant information before making your decision.

The Bigger Picture

The second half of this course could be summarised as *"it's not just about the job in front of you, but about how that job fits into the bigger picture"*. That means you should be thinking about how your particular job or task fits into your team's work, but also how your team's work fits into the broader vision and strategy of your company. There are some hints in the handouts, but you can also use the phone call with your manager, Sarah, to further clarify this.

Assignments Associated with This Project

All of the assignments in the second half of the course relate to the group project. For more information on these assignments, see the cover sheets and

mark schemes available on MyUni, post a question on Piazza, or ask your tutor.

Team Meeting

During the workshop in week 8, you will have your first team meeting. You will need to demonstrate good communication skills as your team discusses how to start the group project. You will also need to submit a brief summary of your team's first meeting.

Email

Based on one of the project handouts, you will need to send a professional email to another Haldon staff member to ask for help with your team's project.

Phone Call

You can call Sarah Simmons to help clarify the project aims and Haldon's "big picture". Schedule a time to complete this with your tutor.

Presentation

In your workshop in week 11 or 12, you will need to give an 8 minute presentation explaining your group's recommendation to Haldon management. Each team member gives their own presentation, discussing the entire team's work.

Report

After week 12, you will need to write-up the details of your recommendation as a business report for Haldon management. Again, each team member needs to write their own report, covering the whole team's work.

Communicating in Your Team

Your team may like to appoint a chairperson. The chairperson is responsible for keeping an overview of your team's progress, and intervening if something goes wrong. To compensate, the chairperson might be given a little less work to do on jobs relating to the actual recommendation. Other team members

are still responsible for their own tasks, and should still have an understanding of what others are doing, and how everyone's work fits together. For the chairperson, there is a greater emphasis on understanding this big picture.

Your team will need to decide on how they want to stay in touch and share information. You are free to use any available tools you want, e.g., messaging apps, Google docs.

Each team member is responsible for sharing relevant information, and for checking relevant places for messages and other material shared by the rest of the group. The team chairperson should keep an overview of this, and intervene if there are any communication issues (e.g., a team member is not participating, contributing information, or completing their assigned tasks). For issues that cannot be solved by your group or by the chairperson, please contact the course coordinator by email at max.glonek@adelaide.edu.au.