Senior Thesis in Mathematics

Thesis Outline

Author:
Firstname Lastname

Advisor:
Dr. Firstname Lastname

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Abstract

In this paper we don't really do much. However, there are a lot of *real* theorems that still need to be proved. That is what you will probably do in your thesis. For now we have the thesis outline.

Contents

Chapter 1

Introduction

1.1 What will go here?

In the introduction I will explain the history of operations research and how it tends to be most utilized in the private sector. I will detail the development of (and necessity for) community-based operations research, and then explain that I will be examining a particular case study: the problem of developing new public parks in Bogotá, Colombia. I will perhaps provide a literature review here, a roadmap of what I will cover in the rest of the thesis, and anything else that may fit and come to mind later.

Chapter 2

Toy Example

2.1 What is a toy example?

In this chapter I will present a simplified version of the model I will be observing. We will take the problem of park allocation and make it significantly easier to understand. We will have less variables, which I will present and explain, as well as less objective functions (since the actual model has six objective functions), and possibly even less constraints. I will walk through the problem explanation, present any relevant information, formulate the model, and solve it. We move on to the real model.

Chapter 3

The Model

3.1 What model?

In here I will actually look at the model, taken straight from the paper I am reading. I will expand upon the toy example, explain the actual situation in more detail, and make note of the extra constraints and objective functions that we will take into account. I will present the mathematical formulation of the model, and examine the solution. Perhaps I will make commentary on particular decisions and assumptions the modelers made when constructing their model.

Chapter 4

Multiobjective Facility Location Problems

4.1 What?

Here we will look at the general class of Multiobjective facility location problems, which is the class of problems that contains the main model/problem I will be looking at for my thesis.

Chapter 5

Discrete Facility Location Problems

5.1 What? pt. II

The problem I will be examining also falls under this category. I am not sure how much this would vary from the previous chapter. But if it turns out there is a significant difference between both types of problems, it might be helpful to provide a dedicated chapter for both. Maybe the only difference is that the other class of problems has many objective functions.

Chapter 6

Applications

If I have time to apply what I have learned to another problem, maybe this will go here. But this may be a bit ambitious. Stay tuned.