

# CS/ECE/ISyE 524 — Introduction to Optimization — Spring 2023

## Best Apartment around Campus

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Please insert your answers in the cells below. Use only Markdown notation, not Julia code

### (A) Issue being addressed in this project

Overall rating of each major student apartment near campus, such as Lucky Apartments, Saxony Apartments, Ovation 309, The Regent Apartments, Pre House Apartments, The Embassy Apartments, The Lakeshore Apartments, Palisade Apartments, Greenbush Apartments, Lark at Randall, Lark at Kohl, X01 Apartments. Based on optimization solvers covered in the course, we will evaluate each apartment's overall ratings and ratings prioritizing each measurement we provide. We are also considering to decide the optimal location to build a best apartment.

### (B) What kind of data will you need, where will it come from, and how will you obtain it?

Data of each apartment: Pet availability Furniture Amenities - gym, swimming pool, study room, lounge, printing devices, in-door washer & dryer, garage Building Year Distance to major campus building Convenience (shops, restaurants, hospital) Crime rate Transportation (distance to bus-stop) Rental Price

We will find apartment details (e.g. amenities, pets availability) on apartment rental websites (e.g. apartments.com), find locations of apartments, restaurants, shops, bus stops, campus buildings with Google Maps Javascript API

([https://developers.google.com/maps/documentation/javascript/places#maps\\_place\\_search\\_javascript](https://developers.google.com/maps/documentation/javascript/places#maps_place_search_javascript)), find bus stop and bus timeline on (<https://map.wisc.edu/>).

### (C) What is the optimization problem underlying this project? (LP, QP, SOCP, MIP, NLP, other?)

The optimization problem underlying this project is Linear Programming.

## **(D) What will you deliver in terms of code, results, outcomes?**

We will deliver code that collected our datasets, analyze and rate each apartment based on factors. During the process of minimizing the commute time from each apartment to the several main buildings on campus, we plan to build a model with which people can determine their transportation method.

In the result section, by combining and analyzing the factors in part (B), we create an independent rating system with specific options for people to prioritize the measurement they care the most.

## **(E) Other points to be considered.**

We are considering that our final goal is to choose the optimal location for a potential new apartment in Madison. To decide this location, we minimize all the factors from part (B) 5-9. However, the issue we face is that factor 1-4 from part (B) is useless. We plan to include this to our model, but we are unsure about whether this can be our final outcome.

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