Module 07 – Maximal Flow

Exploratory Data Analysis

*In this section, you should perform some data analysis on the data provided to you. Please format your findings in a visually pleasing way and please be sure to include these cuts:*

* *Make a visual graph of your data like what we saw for the sample problem*
  + <https://excalidraw.com>
  + <https://mermaid.live>
  + <https://dreampuf.github.io/GraphvizOnline>
  + Powerpoint/Word

A diagram of a tree

AI-generated content may be incorrect.

Model Formulation

*Write the formulation of the model into here prior to implementing it in your Excel model. Be explicit with the definition of the decision variables, objective function, and constraints.*

* Decision Variables
  + Xij = The amount of units flowing from Location i to Location j
    - Example = X32 Amount of units flowing from Peanut Butter Parlor to Nougat Nouk
* Objective Function
  + The maximal level of units flowing from one location to another and the amount of units flowing back to the source from the definition
* Constraints
  + # of Units Flowing from one location to another has to be less than or equal to the Upper bound (The maximum number of units that can be a specific route to another
  + # of Units Flowing from one location to another must be greater or equal to zero
  + The New flow of units must be equal to the Supply of units on hand

Model Optimized for Maximal Flow

*Implement your formulation into Excel and be sure to make it neat. This section should include:*

* *A screenshot of your optimized final model (formatted nicely, of course)*

*A screenshot of a computer

AI-generated content may be incorrect.*

* *A text explanation of what your model is recommending, especially any identified bottlenecks*

*A screenshot of a computer

AI-generated content may be incorrect.*

This model is recommending the amount of units that should travel between different locations in order to maximize the amount of units that can flow through a network. All of the networks that are highlighted in green are bottleknecks because you would not be able to increase the amount units flowing through the system because they are each at capacity as the units that flow through the system in our current optimal solution would be equivalent to the upper bound (the number of units that the location can handle). To increase the optimal solution (the amount of units moving from location to location in the system) you would need to increase the capacity of the destinations of the green routes.