Module 02 - Transportation Modeling

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:

- The locations involved in the analysis (id -> name) and specify if they are a source or a destination
- A table of the average cost between source and destination (for the sake of this assignment, we are dealing with sugar-miles similar to the bushel-mile example from the textbook)

	Bubblegum Bay	Candy Button Bay	Cherry Cordial Cove	Cocoa Bean Crater
Mochi Metropolis	0.06	0.18	0.16	0.11
Marshmallow Meadows	0.15	0.12	0.08	0.16
Pixie Stix Plateau	0.06	0.18	0.05	0.17
Mallow Melt Mountains	0.06	0.05	0.07	0.16
Macaron Market	0.05	0.06	0.10	0.18
Lollipop Lagoon	0.10	0.15	0.06	0.07

Model Formulation

Objective:

$$X15 + X16 + X17 + X18 + X19 + X110 + X25 + X26 + X27 + X28 + X29 + X210 + X35 + X36 + X37 + X38 + X39 + X310 + X45 + X46 + X47 + X48 + X49 + X410 $\geq 0$$$

Constraints:

X15 + X16 + X17 + X18 + X19 + X110 = 125 X25 + X26 + X27 + X28 + X29 + X210 = 143 X35 + X36 + X37 + X38 + X39 + X310 = 115 X45 + X46 + X47 + X48 + X49 + X410 = 105

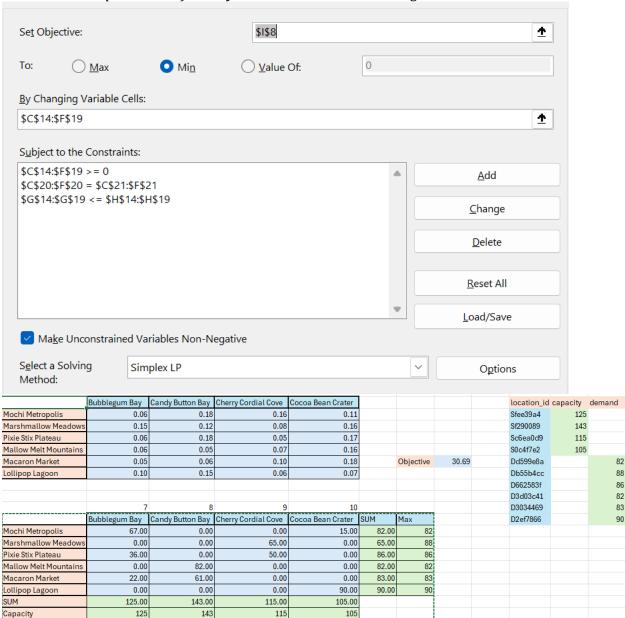
 $X15 + X25 + X35 + X45 \le 82$ $X16 + X26 + X36 + X46 \le 88$ $X17 + X27 + X37 + X47 \le 86$ $X18 + X28 + X38 + X48 \le 82$ $X19 + X29 + X39 + X49 \le 83$ $X110 + X210 + X310 + X410 \le 90$

Model Optimized for Cost Reduction

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 text explanation of what your model is recommending



The model is essentially showing how much will be produced at a certain location and where this product will be going. So for example Mochi Metropolis is the producer for Bubblegum Bay and Cocoa Bean Crater or Marshmallow Meadows is the only producer for Cherry Cordial Cove.

Model with Stipulation

Please copy the tab of your original model before continuing with the next part to avoid messing up your original solution. What happens if you add an additional constraint to the model such that all demand **MUST** be met. Is the solution still feasible? If not, please explain why.

It Is not Feasible in this case as the demand is not able to be met with Mallow Melt mountains due to there being not enough demand for the amount of units produced in total.