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GSCM 330

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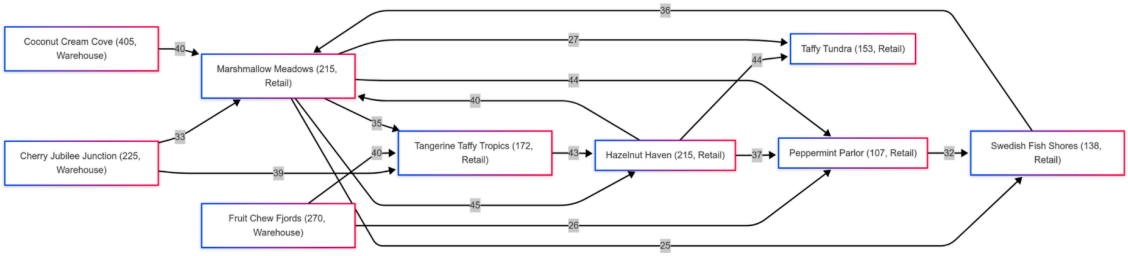
Module 06 – Transshipment Problem

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*



Model Formulation

Minimize the total transportation cost:

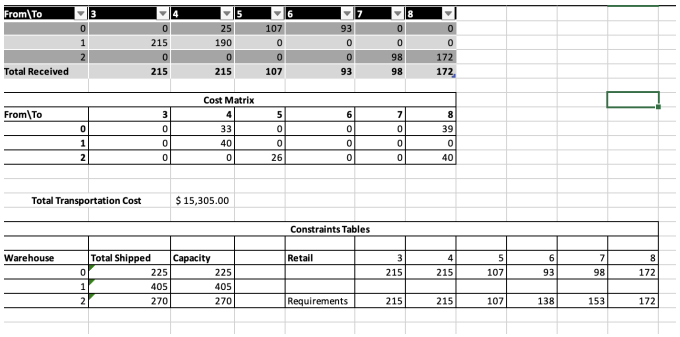
$$\text{Minimize } Z = \sum_{(i,j)\in A} c_{ij}\, x_{ij}$$

Where:

- A is the set of all arcs (routes) in the netwrok
- c i j represents the cost per mile for shipping from location i to location j

Model Optimized for Minimal Transportation Cost

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



From\To	3	4	5	6	7	8
0	0	25	107	93	0	0
1	215	190	0	0	0	0
2	0	0	0	0	98	172
Total Received	215	215	107	93	98	172

Cost Matrix

From\To	3	4	5	6	7	8
0	0	33	0	0	0	39
1	0	40	0	0	0	0
2	0	0	26	0	0	40

Total Transportation Cost $ 15,305.00

Constraints Tables

Warehouse	Total Shipped	Capacity		Retail	3	4	5	6	7	8
0	225	225			215	215	107	93	98	172
1	405	405								
2	270	270		Requirements	215	215	107	138	153	172

Text Explanation:

The transportation model was designed to minizme the total shipping cost while meeting the supply constraints at the warehouse and the demand requirement at the retail locations.

- Cherry Jubilee Junction (Warehouse 0)

- Ships 25 units to marshmallow meadows.
- Ships 107 units to peppermint parlor
- Ships 93 units to swedish fish shores

Model with Stipulation

Please copy the tab of your original model before continuing with the next part to avoid messing up your original solution.

1. **Increase Supply:** Increased supply at one of the sources by 115 units. In the initial attempt, I added these extra units to Warehouse 0 → increasing its supply from 225 to 340

2. **Imbalance:** This change resulted in a total supply equal the total demanded. If the extra units were forced into the existing network
3. **Introduce Dummy:** This dummy mode was assigned a demand equal to the surplus and was connected to each warehouse with a transportation cost of **0**, allowing the extra supply to be used without affecting the overall transportation cost
4. **Rerun Model:** The model with these changes allocated extra 115 units to the dummy retail node. All real retail demand requirements remained satisfied