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*
  + <https://excalidraw.com>
  + <https://mermaid.live>
  + <https://dreampuf.github.io/GraphvizOnline>
  + Powerpoint

A diagram of a network

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.*

*Hint: This one differs a bit from the sample problem in terms of Balance-of-Flow*

Min:

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Constraints

-X03-X06 >= -352 Node 0

-X17-X15>=-313 Node 1

-X25-X24>=-233 Node 2

X03+X53>=215 Node 3

-X46-X48+X74+X24 Node 4

-X57-X53+X15+X25>=184 Node 5

-X68-X67+X06+X46+X76>=107 Node 6

-X78-X76-X74+X67+X57+X17>=153 Node 7

X78+X68+X48>=141 Node 8

Model Optimized for Minimal Transportation Cost

*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*

The model represents a candy store system, where the goal is to optimize the flow of candy between nodes while balancing deficits and surpluses. The model is recommending how to allocate or redistribute candies efficiently.

* *Update your graph from the EDA section to bold/color the links being used (and show how much is going through that link)*

*A diagram of a network

AI-generated content may be incorrect.*

Model with Stipulation

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

*Follow these steps to complete this section:*

1. *Describe the necessity of the Balance-of-Flow for this problem type*

*It’s the constraints for my problem. It allows me to find a solution to my problem*

1. *What happens when you change your model to make Total Supply > Total Demand (i.e. add 115 units to one of the sources?*

*The model does not work.*

1. *What happens when you rerun your model?*

*The model does not work, does not find a feasible solution*

1. *What do you need to change to make your model work again?*

*Since the supply is bigger than the demand, I have to change my constraint from less than to greater than.*

1. *Make the changes and report on your findings.*
   1. *PS there is a small chance that the source you added 115 to may make your model infeasible. If so, add the 115 units to a different source.*

*Now, I have found a solution, and the solver works.*