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)*

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*

Min = .18X15+ .18X16+ .05X17+ .09X18+ .19X19+ .09X110+ .16X25+ .136X26+ .122X27+ .137X28+ .132X29+.129X210+.05X35+.94X36+.065X37+.079X38+.085X39+.073X310+.07X45+.07X46+.05X47+.07X48+ .12X49+.19X410

Subject to

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

X15 + X16 + X17 +X18 + X19 + X110 = 186

X25 + X26 + X27 +X28 + X29 + X210 = 163

X35 + X36 + X37 +X38 + X39 + X310 = 146

X45 + X46 + X47 +X48 + X49 + X410 = 101

X15 + X25 + X35 +X45 ≤ 100

X16 + X26 + X36 +X46 ≤ 116

X17 + X27 + X37 +X47 ≤ 114

X18 + X28 + X38 +X48 ≤ 110

X19 + X29 + X39 +X49 ≤ 101

X110 + X210 + X310 +X410 ≤ 106

Model Optimized for 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 text explanation of what your model is recommending*

*A screenshot of a computer

AI-generated content may be incorrect.*

A screenshot of a spreadsheet

AI-generated content may be incorrect.

The model is recommending how many units to produce at each location, and which shop to send them to while trying to minimize cost and meet all constraints.

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.*

There is not a Feasible solution if this constraint is added, because total demand is greater than total capacity.