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:

		Location 5	Location 6	Location 7	Location 8	Location 9	Location 10
	Row Labels	**Mallow Melt Mountains**	**Molasses Marsh**	**Sherbet Shoreline**	**Snickerdoodle Slopes**	**Sugar Swirl Spires**	**Sugarplum Springs**
Location 1	Chewy Cherry Chews Channel	$ 0.07	$ 0.12	$ 0.19	$ 0.10	$ 0.06	$ 0.14
Location 2	Fizzwhiz Fjord	$ 0.12	$ 0.08	$ 0.18	$ 0.10	$ 0.11	$ 0.10
Location 3	Ginger Snap Garden	$ 0.10	$ 0.06	$ 0.12	$ 0.13	$ 0.15	$ 0.09
Location 4	Gooey Ganache Grotto	$ 0.09	$ 0.17	$ 0.17	$ 0.13	$ 0.09	$ 0.19

Destination	Average Cost
Mallow Melt Mountains	$0.09
Snickerdoodle Slopes	$0.11
Sherbt Shoreline	$0.17
Sugarplum Springs	$0.10
Sugar Swirl Spires	$0.11
Molasses Marsh	$0.13

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:
Location 1 0.07X15 + 0.12X16 + 0.19X17 + 0.10X18 + 0.06X19 + 0.14X110 +
Location 2 0.12X25 + 0.08X26 + 0.18X27 + 0.10X28 + 0.11X29 + 0.10X210 +
Location 3 0.10X35 + 0.06X36 + 0.12X37 + 0.13X38 + 0.15X39 + 0.09X310 +
Location 4 0.09X45 + 0.17X46 + 0.17X47 + 0.13X48 + 0.09X49 + 0.19X410

Constraints:
Total Location 1 (Chewy Cherry Chews Channel): X15 + X16 + X17 + X18 + X19 + X110 = 128

Total Location 2 (Fizzwhiz Fjord): X25 + X26 + X27 + X28 + X29 + X210 = 175

Total Location 3 (Ginger Snap Garden): X35 + X36 + X37 + X38 + X39 + X310 = 179

Total Location 4 (Goey Ganache Grotto): X45 + X46 + X47 + X48 + X49 + X410 = 162

Location 5 (Mallow Melt Mountains): X15 + X25 + X35 + X45 <= 117

Location 6 (Molasses Marsh): X16 + X26 + X36 + X46 <= 127

Location 7 (Sherbet Shoreline): X17 + X27 + X37 + X47 <= 119

Location 8 (Snickerdoodle Slopes): X18 + X28 + X38 + X48 <= 109

Location 9 (Sugar Swirl Spires): X19 + X29 + X39 + X49 <= 119

Location 10 (Sugarplum Springs): X110 + X210 + X310 + X410 <= 122

Objective function: (X15 + X16 + X17 + X18 + X19 + X10 + X25 + X26 + X27 + X28 + X29 + X210 + X35 + X36 + X37 + X38 + X39 + X310 + X45+ X46 + X46 + X47 + X48 + X49 + X410)

Model Optimized for Profit

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*

		Location 5	Location 6	Location 7	Location 8	Location 9	Location 10
	Row Labels	**Mallow Melt Mountains**	**Molasses Marsh**	**Sherbet Shoreline**	**Snickerdoodle Slopes**	**Sugar Swirl Spires**	**Sugarplum Springs**
Location 1	Chewy Cherry Chews Channel	$ 0.07	$ 0.12	$ 0.19	$ 0.10	$ 0.06	$ 0.14
Location 2	Fizzwhiz Fjord	$ 0.12	$ 0.08	$ 0.18	$ 0.10	$ 0.11	$ 0.10
Location 3	Ginger Snap Garden	$ 0.10	$ 0.06	$ 0.12	$ 0.13	$ 0.15	$ 0.09
Location 4	Gooey Ganache Grotto	$ 0.09	$ 0.17	$ 0.17	$ 0.13	$ 0.09	$ 0.19

		Location 5	Location 6	Location 7	Location 8	Location 9	Location 10		
	Row Labels	**Mallow Melt Mountains**	**Molasses Marsh**	**Sherbet Shoreline**	**Snickerdoodle Slopes**	**Sugar Swirl Spires**	**Sugarplum Springs**	**Amount**	**Capacity**
Location 1	Chewy Cherry Chews Channel	0	0	0	54	74	0	128	128
Location 2	Fizzwhiz Fjord	0	0	0	55	0	120	175	175
Location 3	Ginger Snap Garden	0	127	50	0	0	2	179	179
Location 4	Gooey Ganache Grotto	117	0	0	0	45	0	162	162
	Sum	117	127	50	109	119	122		
	Demand	117	127	119	109	119	122		
				Total	55.72000498				

My model is recommending that the optimal solution will cost $55.72.

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.*

The solution is not feasible because the capacity and demand cannot be maxed out, there is no optimal solution.