

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)*

location_id	location	
S947e7b6	Lemon Drop Lagoon	Source
S6e0cec4	Honeycomb Highlands	Source
S4592718	Gummy Grotto	Source
S0c4f7e2	Cocoa Bean Crater	Source
Df0929d3	Taffy Tundra	Destination
D4364665	Praline Park	Destination
D2d95387	Nougat Nook	Destination
D0f6eec2	Tartberry Thicket	Destination
D085fbca	Waffle Cone Wonderland	Destination
D017c84c	Pineapple Pop Paradise	Destination

		Destination	Destination	Destination	Destination	Destination	Destination
		Df0929d3	D4364665	D2d95387	D0f6eec2	D085fbca	D017c84c
Source	S4592718	\$0.13	\$0.05	\$0.19	\$0.11	\$0.13	\$0.06
Source	S947e7b6	\$0.15	\$0.07	\$0.17	\$0.18	\$0.09	\$0.16
Source	S6e0cec4	\$0.07	\$0.10	\$0.06	\$0.16	\$0.09	\$0.14
Source	S0c4f7e2	\$0.09	\$0.19	\$0.16	\$0.09	\$0.08	\$0.17

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

- Objective function is the minimum cost for transportation while capacity is maxed, and the model gets as close as possible to demand
- The decision variables would be demand and capacity
- The constraints are sent is equal to capacity, received is less than or equal to demand, and unconstrained variables must be non-negative or rather zero or greater

Solver Parameters

Set Objective:

To: ☐ Max ☒ Min ☐ Value Of:

By Changing Variable Cells:

Subject to the Constraints:

☒ Make Unconstrained Variables Non-Negative

Select a Solving Method: Options

Solving Method

Select the GRG Nonlinear engine for Solver Problems that are smooth nonlinear. Select the LP Simplex engine for linear Solver Problems, and select the Evolutionary engine for Solver problems that are non-smooth.

Help Solve Close

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

		Df0929d3	D4364665	D2d95387	D0f6eec2	D085fbca	D017c84c			
		Taffy Tundra	Praline Park	Nougat Nook	Tartberry Thicket	Waffle Cone Wonderland	Pineapple Pop Paradise	Capacity		
S4592718	Gummy Grotto	\$0.13	\$0.05	\$0.19	\$0.11	\$0.13	\$0.06	183		
S947e7b6	Lemon Drop Lagoon	\$0.15	\$0.07	\$0.17	\$0.18	\$0.09	\$0.16	144		
S6e0cec4	Honeycomb Highlands	\$0.07	\$0.10	\$0.06	\$0.16	\$0.09	\$0.14	184		
S0c4f7e2	Cocoa Bean Crater	\$0.09	\$0.19	\$0.16	\$0.09	\$0.08	\$0.17	186		
	Demand	130	126	136	123	135	123			
									Objective	\$49.71
		Taffy Tundra	Praline Park	Nougat Nook	Tartberry Thicket	Waffle Cone Wonderland	Pineapple Pop Paradise	Sent	Capacity	
	Gummy Grotto	0	60	0	0	0	123	183	183	
	Lemon Drop Lagoon	0	66	0	0	78	0	144	144	
	Honeycomb Highlands	48	0	136	0	0	0	184	184	
	Cocoa Bean Crater	6	0	0	123	57	0	186	186	
	Demand	130	126	136	123	135	123			
	Received	54	126	136	123	135	123			

My model is recommending that gummy grotto send 60 units to praline park and 123 units to pineapple pop paradise, lemon drop lagoon send 66 units to praline park and 78 units to waffle cone wonderland, honeycomb highlands send 48 units to taffy tundra and 136 units to nougat nook, cocoa bean crater sends 6 units to taffy tundra and 123 units to tart berry thicket and 57 units to waffle cone wonderland. This maximizes capacity at all sources while getting the lowest transportation costs for a total of \$49.71.

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.*



Solver could not find a feasible solution.

Solver can not find a point for which all Constraints are satisfied.

No, it says that it cannot find a feasible solution because all constraints cannot be stratified meaning it cannot find a solution where all demand is met. This is because total demand is 773 while total capacity is 697.