

# Module 02 – Transportation Modeling

## Exploratory Data Analysis

	Marshmallow Meadows	Rock Candy Ridge	Licorice Labyrinth	Mallow Melt Mountains	Lollipop Lagoon	Starburst Starlit Skies	Sent	Capacity
Candy Button Bay	0.00	0.00	17.00	92.00	0.00	0.00	109.00	109
Dulce de Leche Dunes	94.00	0.00	0.00	0.00	78.00	0.00	172.00	172
Fudge Falls	0.00	92.00	24.00	0.00	0.00	0.00	116.00	116
Butter Rum Reef	5.00	0.00	54.00	0.00	0.00	96.00	155.00	155
Received	99.00	92.00	95.00	92.00	78.00	96.00		
Max to send	99	92	95	92	95	96		

## 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:  $17X_{17}+92X_{18}+94X_{25}+78X_{29}+92X_{36}+24X_{37}+5X_{45}+0X_{46}+54X_{47}+96X_{410}$

Supply Constraints:

$$X_{15}+X_{16}+X_{17}+X_{18}+X_{19}+X_{110} \leq 109$$

$$X_{25}+X_{26}+X_{27}+X_{28}+X_{29}+X_{210} \leq 172$$

$$X_{35}+X_{36}+X_{37}+X_{38}+X_{39}+X_{310} \leq 116$$

$$X_{45}+X_{46}+X_{47}+X_{48}+X_{49}+X_{410} \leq 155$$

Capacity Constraints:

$$X_{15}+X_{25}+X_{35}+X_{45}=99$$

$$X_{16}+X_{26}+X_{36}+X_{46}=92$$

$$X_{17}+X_{27}+X_{37}+X_{47}=95$$

$$X_{18}+X_{28}+X_{38}+X_{48}=92$$

$$X_{19}+X_{29}+X_{39}+X_{49}=95$$

$$X_{110}+X_{210}+X_{310}+X_{410}=96$$

Nonnegativity Conditions

$$X_{ij} \geq 0 \text{ for all } i \text{ and } j$$

## 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

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Max to send	99	92	95	92	95	96		

Objective Function      46.34999

## 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.

*This solution is not feasible. The constraints are too restrictive, making it impossible to satisfy all conditions simultaneously.*