Module 02 – Transportation Modeling

Exploratory Data Analysis

	A	B	C
1	location_id	location	Source or Destination
2	S7eda83e	Crispy Rice Reef	Source
3	S5c9e187	Ginger Snap Garden	Source
4	S2c3e08f	Cotton Candy Clouds	Source
5	S01a3d4d	Jolly Rancher Range	Source
6	Df4d06c4	Twizzler Tunnels	Destination
7	Dc20a1c2	Rainbow Sprinkle Summit	Destination
8	Dbc85654	Sugar Swirl Spires	Destination
9	Da7cec12	Pudding Peaks	Destination
10	D9661ca9	Toblerone Tower	Destination
11	D6ca4f41	Marzipan Metropolis	Destination
12			

Average of cost per	Column Labels							
Row Labels	D6ca4f41	D9661ca9	Da7cec12	Dbc85654	Dc20a1c2	Df4d06c4	(blank)	Grand Total
S01a3d4d	$ 0.06	$ 0.08	$ 0.19	$ 0.10	$ 0.08	$ 0.12		$ 0.10
Cotton Candy Clouds	$ 0.18	$ 0.11	$ 0.15	$ 0.17	$ 0.16	$ 0.19		$ 0.16
Ginger Snap Garden	$ 0.07	$ 0.19	$ 0.14	$ 0.08	$ 0.17	$ 0.13		$ 0.13
Crispy Rice Reef	$ 0.13	$ 0.11	$ 0.08	$ 0.07	$ 0.10	$ 0.16		$ 0.11
(blank)								
Grand Total	**$ 0.11**	**$ 0.12**	**$ 0.14**	**$ 0.10**	**$ 0.12**	**$ 0.15**		**$ 0.12**

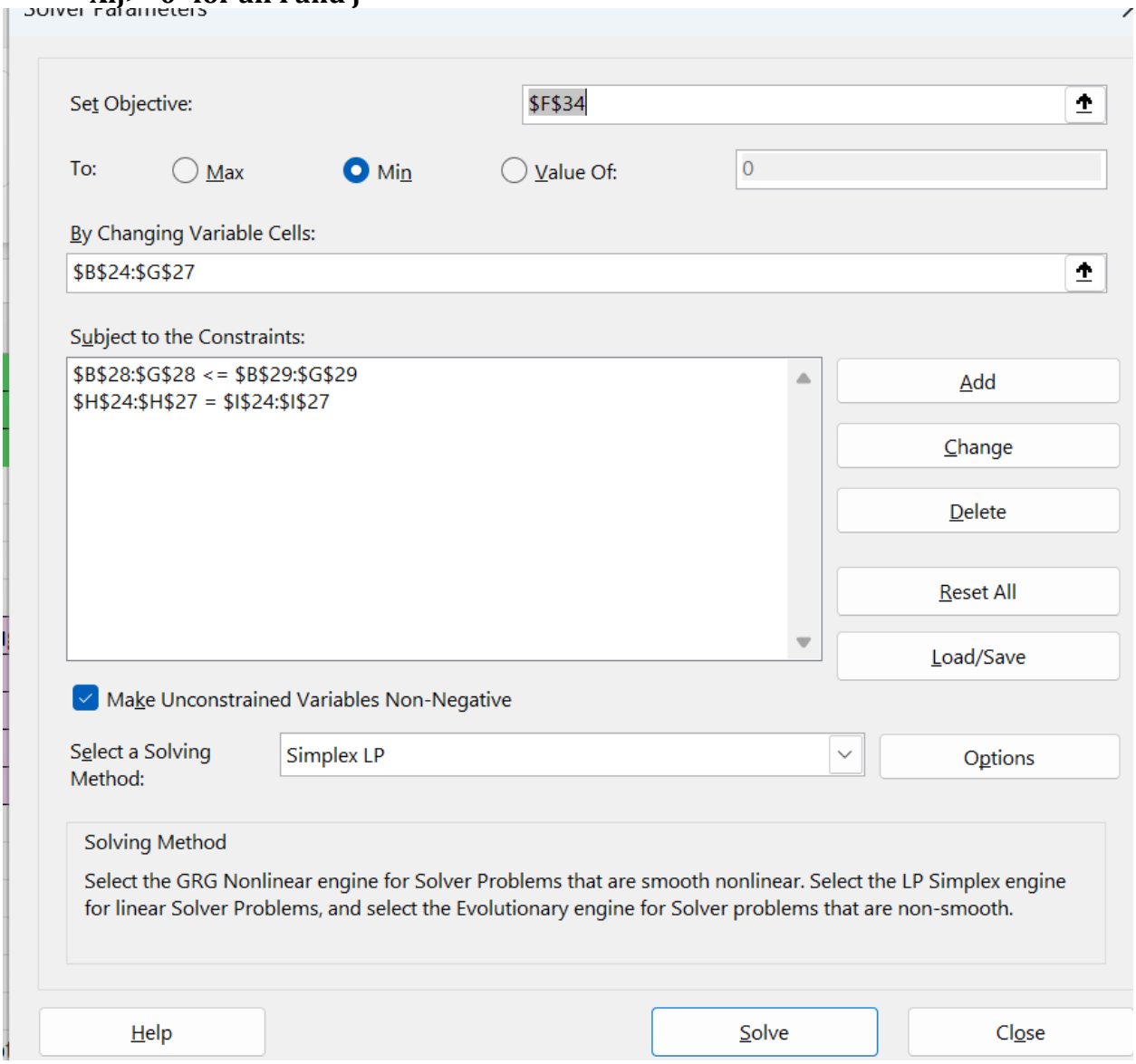
Source	Marzipan Metropolis	Toblerone Tower	Pudding Peaks	Sugar Swirl Spires	Rainbow Sprinkle Summit	Twizler Tunnels	Grand Total		Grand Total
Jolly Rancher Range	$ 0.06	$ 0.08	$ 0.19	$ 0.10	$ 0.08	$ 0.12	$ 0.10		$ 0.10
Cotton Candy Clouds	$ 0.18	$ 0.11	$ 0.15	$ 0.17	$ 0.16	$ 0.19	$ 0.16		$ 0.16
Ginger Snap Garden	$ 0.07	$ 0.19	$ 0.14	$ 0.08	$ 0.17	$ 0.13	$ 0.13		$ 0.13
Crispy Rice Reef	$ 0.13	$ 0.11	$ 0.08	$ 0.07	$ 0.10	$ 0.16	$ 0.11		$ 0.11

Model Formulation

- **MIN 53X14+124X19+125X26+26X27+77X35+14X38+62X38+90X47+103X48**
- **Supply Constraints:**
  - **X15+X16+X17+X18+X19+X110<=177**
  - **X25+X26+X27+X28+X29+X210<=151**
  - **X35+X36+X37+X38+X39+X310<=153**
  - **X45+X46+X47+X48+X49+X410<=193**
- **Capacity Constraints:**
  - **X15+X25+X35+X45=130**

- **X16+X26+X36+X46=125**
- **X17+X27+X37+X47=116**
- **X18+X28+X38+X48=117**
- **X19+X29+X39+X49=124**
- **X110+X210+X310+X410=115**

- **Xij>=0- for all I and j**



- The number of units received had to be less than or equal to the units demanded
- The number of units shipped had to equal the capacity

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*

Source	Marzipan Metropolis	Toblerone Tower	Pudding Peaks	Sugar Swirl Spires	Rainbow Sprinkle Summit	Twizler Tunnels	Shipped	Capacity
Jolly Rancher Range	53.00	-	-	-	124.00	-	177.00	177
Cotton Candy Clouds	-	125.00	26.00	-	-	-	151.00	151
Ginger Snap Garden	77.00	-	-	14.00	-	62.00	153.00	153
Crispy Rice Reef	-	-	90.00	103.00	-	-	193.00	193
Received	130.00	125.00	116.00	117.00	124.00	62.00		
Demand	130	125	116	117	124	115		

Total Cost	$	59.73

My model is recommending that the Fish and Murr Candy Shop should transport a certain amount of units of candy from a certain source location to a certain destination. The units of candy it is transporting from one location to another shown in the pink is the optimal solution by keeping our total costs as low as possible.

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 constraints are too restrictive. Not all conditions would be met.