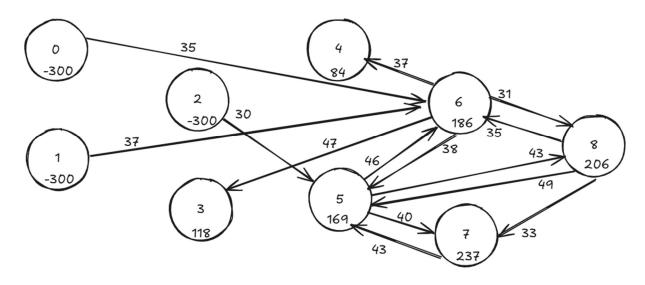
# **Module 06 - Transshipment Problem**

## **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:



#### **Model Formulation**

MIN: 35X06 + 37X16 + 30X25 + 46X56 + 40X57 + 43X58 + 47X63 + 37X64 + 38X65 + 31X68 + 43X75 + 49X85 + 35X86 + 33X87

#### Flow Constraints:

 $-X06 \le -300$ 

 $-X16 \le -300$ 

 $-X25 \le -300$ 

-X56 - X57 - X58 + X25 + X65 + X75 + X85 <= 169

X63 + X64 - X65 - X68 + X06 + X16 + X56 + X86 <= 186

 $-X75 + X57 + X87 \le 237$ 

-X85 - X86 - X87 + X58 + X68 <= 206

## **Model Optimized for Minimal Transportation Cost**

	Total Transportation Cost>			\$51,264.00						
Ship	From	То	Unit Cost			Nodes	Inflow	Outflow	Net flow	Supply/Demand
300	Candyfloss Countryside	6 Rainbow Ribbon Roads	35		0 Ca	andyfloss Countryside	0	300	-300	-300
300	1 Dulce de Leche Dunes	6 Rainbow Ribbon Roads	37		1 Du	ulce de Leche Dunes	0	300	-300	-300
300	2 Marshmallow Meadows	5 Pudding Peaks	30		2 M	arshmallow Meadows	0	300	-300	-300
0	5 Pudding Peaks	6 Rainbow Ribbon Roads	46		3 M	eringue Mountains	118	0	118	118
131	5 Pudding Peaks	7 Vanilla Valley	40		4 Pi	xie Stix Plateau	84	0	84	. 84
0	5 Pudding Peaks	8 Waffle Cone Wonderlan	d 43		5 Pu	udding Peaks	300	131	169	169
118	6 Rainbow Ribbon Roads	3 Meringue Mountains	47		6 Ra	ainbow Ribbon Roads	600	414	186	186
84	6 Rainbow Ribbon Roads	4 Pixie Stix Plateau	37		7 Va	anilla Valley	137	0	137	237
0	6 Rainbow Ribbon Roads	5 Pudding Peaks	38		8 W	affle Cone Wonderland	212	6	206	206
212	6 Rainbow Ribbon Roads	8 Waffle Cone Wonderlan	d 31							
0	7 Vanilla Valley	5 Pudding Peaks	43							
0	8 Waffle Cone Wonderland	5 Pudding Peaks	49							
0	8 Waffle Cone Wonderland	6 Rainbow Ribbon Roads	35							
6	8 Waffle Cone Wonderland	7 Vanilla Valley	33							

This explains that the optimal solution is \$51,264.

### **Model with Stipulation**

- 1. Describe the necessity of the Balance-of-Flow for this problem type
  The necessity of the balance of flow for this problem type is that total supply has to be less
  than total demand
  - 2. What happens when you change your model to make Total Supply > Total Demand (i.e. add 115 units to one of the sources)

The negative 300 will then become -185

- 3. What happens when you rerun your model? When I rerun the model, the optimal solution is about \$10,000 less but also does not create a feasible solution
- 4. What do you need to change to make your model work again? You need to make the total supply less than total demand to make your model work
  - 5. Make the changes and report on your findings.
    - a. PS there is a small chance that the source you added 115 to may make your model infeasible. If so, add the 115 units to a different source.

This creates a feasible solution that is \$41,732 which is about \$10,000 less than the first optimal solution.

	Α	В	C	D	E	F	G	Н	I	J	K	L	M
		To	otal Transportation Cost>				\$41,732.00						
•	Ship		From		То	Unit Cost			Nodes	Inflow	Outflow	Net flow	Supply/Demand
	185	0 C	andyfloss Countryside	6	Rainbow Ribbon Roads	35		C	Candyfloss Countryside	0	185	-185	-185
	300	1 D	ulce de Leche Dunes	6	Rainbow Ribbon Roads	37		1	Dulce de Leche Dunes	0	300	-300	-300
	300	2 M	arshmallow Meadows	5	Pudding Peaks	30		2	Marshmallow Meadows	0	300	-300	-300
	0	5 Pt	udding Peaks	6	Rainbow Ribbon Roads	46		3	Meringue Mountains	9	0	9	118
П	131	5 Pt	udding Peaks	7	Vanilla Valley	40		4	Pixie Stix Plateau	84	0	84	. 84
	0	5 Pt	udding Peaks	8	Waffle Cone Wonderland	43		5	Pudding Peaks	300	131	169	169
	9	6 Ra	ainbow Ribbon Roads	3	Meringue Mountains	47		6	Rainbow Ribbon Roads	485	299	186	186
	84	6 Ra	ainbow Ribbon Roads	4	Pixie Stix Plateau	37		7	Vanilla Valley	131	0	131	237
	0	6 Ra	ainbow Ribbon Roads	5	Pudding Peaks	38		8	Waffle Cone Wonderland	206	0	206	206
	206	6 Ra	ainbow Ribbon Roads	8	Waffle Cone Wonderland	31							
	0	7 V	anilla Valley	5	Pudding Peaks	43							
	0	8 W	affle Cone Wonderland	5	Pudding Peaks	49							
	0	8 W	/affle Cone Wonderland	6	Rainbow Ribbon Roads	35							
	0	8 W	affle Cone Wonderland	7	Vanilla Valley	33							