Module 02 – Transportation Modeling

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

- **MAX=**

$0.07X_{15}+0.19X_{16}+0.11X_{17}+0.16X_{18}+0.13X_{19}+0.10X_{20}+0.11X_{25}+0.06X_{26}+0.18X_{27}+0.07X_{28}+0.05X_{29}+0.08X_{30}+0.07X_{35}+0.07X_{36}+0.08X_{37}+0.18X_{38}+0.17X_{39}+0.15X_{40}+0.08X_{45}+0.11X_{46}+0.11X_{47}+0.17X_{48}+0.16X_{49}+0.12X_{50}$

- **Total For Candy Cane Canyon**
  - $X_{15}+X_{16}+X_{17}+X_{18}+X_{19}+X_{20} = 131(?)$
- **Total For Choco Volcano**
  - $X_{25}+X_{26}+X_{27}+X_{28}+X_{29}+X_{30} = 117 \ (?)$
- **Total For Fruit Chew Fjords**
  - $X_{35}+X_{36}+X_{37}+X_{38}+X_{39}+X_{40} = 168 \ (?)$
- **Total For Butter Rum reef**
  - $X_{45}+X_{46}+X_{47}+X_{48}+X_{49}+X_{50} = 108 \ (?)$
- **MAX for Molten Mocha Marsh**
  - $X_{15}+X_{25}+X_{35}+X_{45} >= 99$
- **MAX for Vanilla Valley**
  - $X_{16}+X_{26}+X_{36}+X_{46} >= 100$
- **MAX for Marzipan Metropolis**
  - $X_{17}+X_{27}+X_{37}+X_{47} >= 103$
- **MAX for Soda Pop Springs**
  - $X_{18}+X_{28}+X_{38}+X_{48} >= 93$
- **MAX for Mallow Melt Mountains**
  - $X_{19}+X_{29}+X_{39}+X_{49} >= 101$
- **MAX for Pineapple Pop Paradise**
  - $X_{20}+X_{30}+X_{40}+X_{50} >= 102$
- **Optimal Solution**
  - (0,0,17,93,21,0,0,31,86,0,0,0,99,69,0,0,0,0,0,0,0,0,6,102)

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)*

	Molten Mocha Marsh	Vanilla Valley	Marzipan Metropolis	Soda Pop Springs	Mallow Melt Mountains	Pineapple Pop Paradise	Sent	Capacity
Candy Cane Canyon	0	0	17	93	21	0	131	131
Choco Volcano	0	31	86	0	0	0	117	117
Fruit Chew Fjords	99	69	0	0	0	0	168	168
Butter Rum Reef	0	0	0	0	6	102	108	108
Received	99	100	103	93	27	102		
Max	99	100	103	93	101	102		
Optimal for Profit	61.78							

- *A text explanation of what your model is recommending*
  - *My model is giving you the optimal profit of about 61.78 and suggesting an optimized distribution of shipments from each source to different destinations while still staying in the capacity limits. It also ensures that the demand is met without going over the limit or exceeding capacity.*

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.*