

# Tutorial 5 Practice Activity

**Here for your own benefit and practice (best to do it individually)**

*Recommended completion: End of week 06 (or before midterm exam)*

**Grading: 0% (Practice for assignments and tests)**

*Problem Adapted from Rardin (2017) Chapter 5*

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## Background

This is a simple problem to help you get more practice with standard formations and using slack/surplus variables to identify basic feasible solutions. **Emma's Elixir Emporium™** uses different components to create one of two fabulous drink flavours beloved by all customers. The two flavours and what they require are:

- Jamie Juice (JJ): One JJ requires one cup of passion fruit juice, one cup of raspberry purée, and four cups of spring water.
- Lloyd Libation (LL): One LL requires one cup of mango concentrate, one cup of raspberry purée, and two cups of water.

Emma would like to know how many JJ and LL drinks she should produce given her current supply of ingredients. On hand, she currently has:

- 1000 cups of passion fruit juice.
- 1500 cups of mango concentrate.
- 1750 cups of raspberry purée.
- 4800 cups of spring water.

Emma can sell each JJ for \$12 and each LL for \$9, as it is a smaller serving.

## Tasks

1. Formulate this optimization problem.
2. Convert the problem to standard form, introducing any slack or surplus variables necessary.
3. Identify the initial basic feasible solution corresponding to the positivity constraints for the amount of LL and JJ produced being **nonbasic**.
4. Plot the problem and find the solution graphically.
5. Solve the problem using the Simplex Search.