CS 150: Spring 2015
Project III: **Due: 11:55pm, Saturday May 9, 2015**

Version as of: 16:48 Sunday 26th April, 2015

Introduction

We now conclude the semester's foray into cuisine with a project on bringing food from farm to the table. Project 3 will extend your work from Project 2. You can choose from one of the following options:

1. Extend/Modify your implementation of project 2
2. Extend/Modify another student's implementation of project 2
3. Implement a simplified version of project 2

Project Description

Many of the better restaurants advertise that their dishes come from locally sourced ingredients. That means that the total cost of a meal (to the restaurant) is dependent upon:

1. the cost of the ingredient charged by the farm, and
2. the cost of transporting the ingredient from the farm.

The data you will be provided with consists of the following:

- a list of restaurants,
- a list of farms and for each farm, their products and the cost of each product,
- an interconnection graph that shows the connecting roads between restaurants and farms.

Your program will work as follows:

1. read (from a file - *recipe.txt*) the database of recipes (project 2),
2. read (from a file - *restaurants.txt*) a list of restaurants,
3. read (from a file - *farms.txt*) a list of farms, ingredients and costs,

4. read (from a file - e.g.) a connectivity graph,
5. read (from the console) the cost per distance unit in the connectivity graph,
6. read (from the console) the number of meals to plan for (this affects the total cost of ingredients),
7. read (from the console) a *plan* command along with the requirements (same as in Project 2),
8. generate the meal plan that matches,
9. find the minimum cost (to the restaurant) for the plan,
10. print the costs (including the costs and source for each ingredient) for each of the restaurants. The output will also include the route for collecting the ingredients.

Project Data

Your program will read in data from the following files:

1. recipe information from a file *recipe.txt*,
2. restaurant information from a file *restaurants.txt*. The file consists of a series of lines, each one of which is the label of a node in the connectivity graph (see below),
3. farm information from a file *farms.txt*. The format of each line of the file is:

   ```
   farm <node name> - <ingredient1> <cost> <ingredient2> <cost> ...
   ```

4. connectivity (graph information) from a file *connectivity.txt*. The format of the file is:

   ```
   <node name> - <node name> <edge weight>
   ```

Project Analysis and Report

Your report should include:

- a description of the algorithm(s) that you used,
- assumptions made,
- the quality of the solution, i.e., how good is the solution based in your opinion?
- analysis of the program's performance on the provided set of data. For example, how does the solution change as the number of meals and the mileage cost vary? How does the program's performance change as the size of the data (graph) changes?
- a **complete** list of the people with whom you have discussed the project.

Project Constraints

The following constraints apply to the project:

1. The project is to be completed individually. The only person you can consult about code issues is the instructor.

Grading

Your project will be graded on the following criteria (assuming the program compiles and runs):

1. correctness of the program
2. documentation (methods and classes) including javadoc
3. unit testing
4. object oriented design
5. quality of the evaluation and analysis