CS 2401 Assignment #2

Due Date: Sunday, Feb 5, 11:59PM

(See the syllabus for late policy)

Objective: The goal of this assignment is to practice two-dimensional and ragged arrays.

Background: A nutritionist has contracted you to create a software that will help clients count calories consumed.

Assignment (part 1): The client will provide data in the form of a text file. Each line will contain three numbers separated by spaces. The numbers represent the number of calories consumed for breakfast, lunch and dinner, respectively. For part 1, you should assume that the file includes data for exactly one week (i.e., seven lines of text representing seven days Monday to Sunday). Your program should read the data from the file into a 2-dimensional array of size 7×3, where each row will keep record of calories consumed for breakfast, lunch, and dinner. Then, compute and print out the following information:

- a list of the total number of calories consumed each day from Monday to Sunday
- the average number of calories consumed each day
- the average number of calories (average over the week) consumed in each of the three meals
- the maximum number of calories consumed each day
- the maximum number of calories consumed in each meal type

Your program **must** have separate methods for reading in the data and for printing each of the different quantities given above. Please do not just put all of your code into the main method.

Example input file:

```
200 1000 800
450 845 1200
800 250 400
0 1500 1800
600 500 1000
700 1400 1700
675 400 900
```

You should print an error message and terminate if there are not exactly three numbers on each line, and exactly 7 lines overall.

Assignment (part 2): The client comes back and would like you to make the program more general, so that it can handle any number of meals in any of the days of a week. That is, you no longer know that there will be exactly three columns in the data; however, the number of lines is still seven. Consider that the first meal of the day is "Meal 1", the second meal is "Meal 2", so and so forth.

Example input file:

```
200 1000
450 845 1200 800
800
400 1500 1800 200
500 1000
700 1400 170
675 400 100 400 300
```

Take your code from part 1 and change the implementation to use the concept of 2-dimensional Ragged Array that we discussed in the class. The client is interested in the following information now.

- the average number of calories consumed each day
- the average number of calories consumed in every meal of the week. For the example input file above the list of averages for Meals 1 to 5 is: 532.1428571, 1024.166667, 817.5, 466.6666667, and 300.

Deliverables: You are expected to submit two Java files (`Calories1.java` for part 1 and `Calories2.java` for part 2) via Blackboard. Notice that `Calories1.java` should not work if the input file has a ragged input set. However, `Calories2.java` should be generic enough such that it would work for ragged or rectangular matrix in the input file.

You have to demo your programs within one week after the due date. Your demo will be based on your last submission in the Blackboard. Your TA will instruct you with further details.