CS 2401 Assignment #2

Due Date: Sunday, February 7, 11:59PM

(See the syllabus for late policy)

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

Background: In a local clinical care unit, a nurse generally measures temperature of every patient six times a day and records the readings in a chart. The clinic contracted you to create a tracking software that will help them analyze weekly data.

Assignment (part 1): The client will provide data in a text file for each patient. Each line of a text file will contain six numbers separated by spaces or by tabs. The numbers in one line represent the temperature measured six times a day. These six times of the day are called T1, T2, T3, T4, T5, and T6. For part 1 of this assignment, 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 7×6, where each row will keep record of temperatures measured at times T1, T2, T3, T4, T5, and T6. Then, compute and print out the following information:

- The average temperature of a patient each day from Monday to Sunday
- The average temperature of a patient over the week at times T1, T2, T3, T4, T5, and T6.
- The maximum temperature of a patient each day from Monday to Sunday
- The maximum temperature of a patient over the week at each times of the day T1, T2, T3, T4, T5, and T6.
- On which day the patient had maximum average temperature
- At which time of the day (T1, T2, T3, T4, T5, or T6) the patient had maximum average temperature

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:

```
98      95      95      102     97      99
99      96      96      103     97.5    100
99.5    97      97      100     98      101
100     97.5    97.5    101     99      101.5
101     98.5    98      101     100     102.5
99.5    95.5    95.5    102.5   98      99.5
99.5    95      96.5    102     97.5    99
```

You should print an error message and terminate if there are not exactly six 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 temperatures measured in any of the days of a week. That is, you no longer know that there will be exactly six columns in the data; however, the number of lines is still seven.

Example input file:

```
98   95   95   102
99   96
99.5 97
100  97.5 97.5
101  98.5 98   101  100  102.5
99.5
99.5 95   96.5 102  97.5
```

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. You program should output the following items as part 2 of the assignment.

- The average temperature of a patient each day from Monday to Sunday
- The average temperature of a patient at times covered in the data. For the input data provided in the sample input, the averages will be 99.5, 96.5, 96.75, 101.6666667, 98.75, 102.5.

You should print an error message and terminate if there are not exactly not exactly 7 lines. Each line may contain arbitrary number of double precision numbers. Notice that a line can be even empty.

Deliverables: You are expected to submit two Java files (`Temperature1.java` for part 1 and `Temperature2.java` for part 2) via Blackboard. 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.