

CS 2401 – Elementary data structures and algorithms

Spring 2023

Lab 2

Due Date: Sunday, February 5, 2023 – end of day.

Objective: The goal of this assignment is to practice with a 2-dimensional array.

Background: We are given a file with data for pecan farms and their pecan production per month. We will have to compute some values for these data.

Assignment: The input file, input.txt, contains monthly pecan production data for some pecan farms. Each column represents a month, starting from January. The values in the column are comma separated. Each line or row represents a farm.

Read the file and place the values in a 2D array of integers called data. Complete the following tasks by computing the necessary information. Use the given method header for each task. Call these methods from the main method with the data array.

1. Average pecan production per farm: Compute the average production for each firm.
`public static void farm_avg(int[][] data){`
2. Average pecan production per month: Compute the average production for each month.
`public static void month_avg(int[][] data){`
3. Top three farm with the highest pecan production: Display the farm index and the total production of that firm.
`public static void top_farms (int[][] data){`
4. Top three months with the highest pecan production: Display the index of the month and the production amount.
`public static void top_months (int[][] data){`

Your program should use a try-catch block properly to handle file reading.

Sample input:

```
15, 50, 62, 72, 73, 74, 80, 55, 46, 43, 34, 19
58, 60, 70, 73, 76, 82, 87, 65, 51, 42, 26, 19
43, 59, 65, 72, 82, 65, 64, 53, 51, 41, 27, 22
18, 42, 63, 69, 73, 85, 84, 65, 44, 38, 27, 14
19, 46, 50, 77, 82, 95, 98, 93, 84, 74, 17, 10
```

Sample output:

```
Sum of farm:0 is :623.0
Average production for farm 0 is: 51.916666666666664
Sum of farm:1 is :709.0
Average production for farm 1 is: 59.083333333333336
Sum of farm:2 is :644.0
Average production for farm 2 is: 53.666666666666664
Sum of farm:3 is :622.0
Average production for farm 3 is: 51.833333333333336
Sum of farm:4 is :745.0
Average production for farm 4 is: 62.083333333333336

Average production for month 0 is: 30.6
Average production for month 1 is: 51.4
Average production for month 2 is: 62.0
Average production for month 3 is: 72.6
Average production for month 4 is: 77.2
Average production for month 5 is: 80.2
Average production for month 6 is: 82.6
Average production for month 7 is: 66.2
Average production for month 8 is: 55.2
Average production for month 9 is: 47.6
Average production for month 10 is: 26.2
Average production for month 11 is: 16.8

Farm with the first highest production: 4 with production: 745
Farm with the second highest production: 1 with production: 709
Farm with the third highest production: 2 with production: 644

Month with the first highest production: 6 with production: 413
Month with the second highest production: 5 with production: 401
Month with the third highest production: 4 with production: 386
```

Deliverables: You are expected to submit two files in Blackboard:

- (i) [Lab2_Lastname_Firstname.java](#) --- the java file of your program.

Grading Criteria:

- [10 points] Program compiles and runs.
- [5 points] The program is indented correctly.
- [5 points] The program is documented properly.
- [5 points] The program uses correct variable types.
- [5 points] The program uses meaningful variable names.
- [10 points] Read data from the file
- [60 points] The program has a correct logic and generates correct output.
 - 15 points for each method

- Late submission: [-10] points for every 24 hours after the deadline.

If you need any clarification, please ask your TA for further details.