CS 5000, Summer 2025
Assignment #7, 50 Points

Multi-Dimensional Arrays – Chapter 8

Develop a complete Java program for each of the following problems. Please name the programs as indicated and add proper program headers and output labels as shown below. ***Please use <u>only</u> concepts and programming constructs/syntax we discuss to date.***

Program #1 (25 points): Design and implement a Java program (name it `WeeklyHours`) to compute the total weekly hours for 3 employees. A 2D-Array of size 3x7 is used to store employers' daily hours. Each row represents one employee and each column represent one day of the week such that column 0 designates Monday, column 1 designates Tuesday, etc. <u>The main method populates the array with random numbers between 0 and 10</u> and then prints out the array in rows and columns as shown below with proper row and column labels. The main method then calls another method (name it `addHours`) that takes the 2D-Array as a parameter and displays the total weekly hours for each employee as shown below with proper column labels.

Design the main method such that it allows the user to re-run the program with different values (as in previous assignments, using a sentinel loop). Document your code and organize and space the outputs properly using escape characters as shown in the following sample outputs. Make sure your code displays the outputs following the test data format below (with spaced, tabs, and blank lines):

<u>First test:</u>

```
            Mon   Tue   Wed   Thu   Fri   Sat   Sun
Employee1    5     3     2     9     6     5     7
Employee2    7     6     8     5     5     4     5
Employee3    1     2     2     1     5     8     7

Employee#       Weekly Hours
----------------------------
    1               37
    2               40
    3               26
```

<u>Second test:</u>

```
            Mon   Tue   Wed   Thu   Fri   Sat   Sun
Employee1   10     2     7     2     0     3     8
Employee2    5     6     1     5     1     4     2
Employee3    1     5     2     6     4     8     7

Employee#       Weekly Hours
----------------------------
    1               32
    2               24
    3               33
```

Program #2 (25 points): Design and implement a Java program (name it `MatrixAddition`) to implement matrix addition operation. Notice that the 2 matrices must be of the same size. For simplicity, use two 2D-Arrays of size 3x3. The main method asks the user to populate the arrays with <u>integer numbers</u>, and then displays the 2 arrays as shown below. Next, the main method calls another method (name it `add`) that takes the 2 arrays as parameters, adds the 2 arrays, and then displays the resulting array as shown below.

Design the main method such that it allows the user to re-run the program with different sets of inputs (as in previous assignments, using a sentinel loop). Document your code and organize and space the outputs properly using escape characters as shown in the following sample output. Make sure your code displays the outputs following the test data format below (with spaced, tabs, and blank lines):

First test:

```
Matrix A:
    3   -4    2
    1    1    1
    6    4   -9

Matrix B:
    1    1    1
    1    1    1
    1    1    1

Matrix A+B:
    4   -3    3
    2    2    2
    7    5   -8
```

Second test:

```
Matrix A:
    1    1    1
    2    2    2
    3    3    3

Matrix B:
    1    1    1
    1    1    1
   -1   -1   -1

Matrix A+B:
    2    2    2
    3    3    3
    2    2    2
```

Submission:

1. Before submitting your programs, make sure you review the assignment submission requirements and grading guidelines posted in D2L. The grading guidelines explain some of the common errors found in programming assignments.
2. The assignment due date is posted in D2L.
3. Please compile, run, and test your code right before you upload your java files to the assignment submission folder in D2L.
4. Please upload only the .java files (total 2 files).