Fundamentals of Programming 2
Exercise sheet 3 5%

***** READ THE QUESTIONS CAREFULLY *****
***** NAME YOUR FILE CarSales.java and SumRows.java *****
***** SUBMIT NEAT, TIDY AND INDENTED CODE *****

Question 1

The table below shows the yearly car sales for Murphy's used cars. The rows in the table show the manufacturer of each car sold and the columns represent the months from January through to December. Write a Java program called **CarSales.java** that prints the table as shown along with the total sales for each month.

Murphy's Car Sales Data

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Ford	5	10	8	7	9	7	11	5	6	3	2	2
Peugeot	2	6	7	4	6	4	7	4	3	4	3	1
Mazda	2	4	5	4	5	3	4	4	2	3	3	2
Nissan	4	5	8	10	8	7	6	5	5	4	3	2
Renault	1	2	4	5	4	2	3	2	0	0	0	0

Your output should look as follows:

```
         Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
   Ford    5  10   8   7   9   7  11   5   6   3   2   2
 Peugeot   2   6   7   4   6   4   7   4   3   4   3   1
  Mazda    2   4   5   4   5   3   4   4   2   3   3   2
  Nissan   4   5   8  10   8   7   6   5   5   4   3   2
 Renault   1   2   4   5   4   2   3   2   0   0   0   0
=================================================================
          14  27  32  30  32  23  31  20  16  14  11   7
```

Your solution must use the following method declarations in your program. See template code provided on MOODLE.

public static void printCarSales(int[][] array, String[] months, String[] manufacturers)

public static int[] calculateTotals(int[][] array)

public static void printTotals(int[] array)

Question 2

Write a Java program called **SumRows.java** that creates a 2D integer array of size 10x12. Your program should initialise the 2D array with random values between 1-20. It should also calculate the row totals for the 2D array and print them in tabular format. Your program **must use** parameterised **procedures** and **functions** wherever possible to decompose the problem down into smaller parts (see lecture notes for examples).

Your output should look something like this:

```
 9  10   2  18   9  10   5   3  17   5  10   7  = 105
 4   7  10   7   5   2  11  12  14   8   7   9  = 96
18  11  14  10   4   4   1   3   1  14   2  10  = 92
 4  17   8  16  18   5   2   9   7  12   5  11  = 114
 1   6  14   7  15   4   5   3  19  13  10   4  = 101
17  14   7  17  15  19  16  16   2  18  18   9  = 168
 9  10  14   3  16   5  18  17   9   4  14   1  = 120
17  11   2  14  11  16  16   1  10  14  19   2  = 133
19   7   2  18  19   8  14  15  17  10   9  14  = 152
15  12  17  15  14   3   5  15  11  15   2   9  = 133
```

NOTES

- All of the information required to solve Q1 and Q2 is in the lecture notes. Please review the lecture notes and MOODLE resources before starting this worksheet.
- Your code must be properly indented, neat and contain comments explaining your solution. Marks will be lost for code that is sloppy and you will receive 0 marks for code that does not compile.

Deliverables

Place all your Java source files in a folder called **Week3**. Zip the Week3 folder and upload the zip file using the Week3 upload link for your group on MOODLE.

All work must be submitted during your scheduled practical sessions.

Plagiarism

This assessment should be an individual piece of work. Any evidence of plagiarism will result in a grade of zero for all parties involved and will trigger the Universities plagiarism policy 3AS08 (see course coordination page).