Laboratory Assignment #1

Part 1: Super Store

Assume that you have a store of products to sell. This store has three kinds of products that are sold either in-store or online. An example sales data of the store for one month of a one-year period is as follows:

	Price	**In-store**	**Online**
Products	TL	Kg	Kg
A	15	20	35
B	20	15	42
C	25	18	38

You can find the dataset along with this document in Blackboard. The dataset consists of 12 .csv files, each corresponding to a month's worth of sales. Read each one and store the contents separately.

The officials of the store wants to know certain information about the sales of these products:

(1) The total sale amount that the store has completed for the full year,

(2) The total in-store sales (TL) for a month,

(3) The total online sales (TL) for a month,

(4) The total in-store sales (TL) for a year,

(5) The total online (TL) for a year and

(6) The total sales for the particular products A, B and C for a year.

You should use matrix operations in your Java application to solve these problem. For instance, if you use matrix multiplication and matrix addition for the amounts and prices of the products in the following format, then you will calculate the total sales in one month and one year as follows:

Amounts   Price   Total Sales

$$\begin{matrix} \text{In-store:} \\ \text{Online:} \end{matrix} \begin{bmatrix} 20 & 15 & 18 \\ 35 & 42 & 38 \end{bmatrix} \begin{matrix} \\ \end{matrix} X \begin{bmatrix} 15 \\ 20 \\ 25 \end{bmatrix} \begin{matrix} A \\ B \\ C \end{matrix} = \begin{bmatrix} 20*15+15*20+18*25 \\ 35*15+42*20+38*25 \end{bmatrix} = \begin{bmatrix} 1050 \\ 2315 \end{bmatrix}$$

$$\overset{\text{Jan}}{\begin{bmatrix} s_1 \\ s_2 \end{bmatrix}} \ + \ \overset{\text{Feb}}{\begin{bmatrix} s_3 \\ s_4 \end{bmatrix}} \ + \ \overset{\text{Mar}}{\begin{bmatrix} s_5 \\ s_6 \end{bmatrix}} \ + \ \overset{\text{Apr}}{\begin{bmatrix} s_7 \\ s_8 \end{bmatrix}} \ + \ \overset{\text{.......}}{...} \ + \ \overset{\text{Dec}}{\begin{bmatrix} s_{23} \\ s_{24} \end{bmatrix}} \ = \ \overset{\text{Total Year}}{\begin{bmatrix} s_{ins\_total} \\ s_{onl\_total} \end{bmatrix}}$$

This illustration corresponds to the tasks (1) through (5). Task (6) requires slightly different linear algebra operations.

Every statistic should be stored conveniently. Finally, display:

- The stats for each month (in-store sales & online sales)
- The stats for the entire year (in-store sales & online sales)
- The stats for each product for the entire year (in-store sales & online sales)