Laboratory in1278LR Introduction to Programming with Java
Delft University of Technology, Faculty EWI, Software Engineering Research Group.
Group = 3; Remainder = 2

Assignment 3
Create a new directory with the name Assignment3.
Use this directory to save all programs that you will create as part of this assignment.

Part 1
Construct an array of size 12. Each of the array elements contains a digit in the range 0 .. 10 being the result of 12 experiments on personA.

7	2	5	8	10	6	5	9	1	3	5	7

A second array contains the results of doing the same 12 experiments on personB.

7	5	5	9	4	5	6	10	3	5	4	4

You may use static initialization to fill both arrays.
Create a third array. This array should be the same size as the two other arrays. Each element in the third array should contain the square of the difference between the corresponding elements of array1 and array2, i.e. : $array3_i = (array1_i - array2_i)^2$. You should fill this array by writing Java-statements; not initializations.

- Print the third array.
- Find the maximum value of the third array; return the value and the index where it occurs.

Part 2
Imagine a distant solar system having several planets. Because we cannot pronounce the names of these planets we number them 0, …, 9. Each of these planets has a starting population of 43E05, 77.77E07, 22.0E06, 33.7E04,3.141592E06, 2.8E05, 88.99E06, 29.7E06, 15.3E09, 23.17E08 inhabitants respectively.

On all the planets there is a birth surplus of the *then current* population of 1.1 % per year. Due to a planet wide warming-up, the liveable area on planet 7 decreases each year.
The Interplanetary Council has therefore decided that the population of planet 7 should be moved to the other planets. Each year, 3.5 % of the *then current* population of planet 7 will be moved to other planets. The inhabitants moved will be divided up evenly over the other planets.
The meaning of *then current*, is understood to be the following. We start with the situation on Dec. 31. We then calculate the changes needed to the population data on Jan. 1st. The situation remains constant for the rest of the year.

Using two one-dimensional arrays for storage of the population of the planets, calculate and print (using DecimalFormat) for each succeeding year the planet population data.

Stop your calculation when the yearly **loss** in inhabitants for planet 7 is lower than 165,000 inhabitants. How many iterations have been needed?

Part 3
Modify your solution to the previous exercise to store the population of planet 7 over the many years into an array.
Have the array plotted as a bar-chart using the plot package.

Part 4 Two-dimensional arrays

Consider a two-dimensional array of data as given in the table below:

	Jan	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sept**	**Oct**	**Nov**	**Dec**
1990	3.0e5	3.1e5	3.2e5	3.4e5	3.7e5	3.7e5	3.8e5	3.7e5	3.8e5	3.5e5	3.2e5	3.2e5
1991	3.1e5	3.3e5	3.3e5	3.5e5	3.9e5	3.8e5	3.9e5	3.7e5	3.8e5	3.1e5	3.2e5	3.2e5
1992	3.2e5	3.3e5	3.5e5	3.5e5	3.9e5	3.9e5	4.0e5	4.1e5	4.0e5	4.0e5	3.3e5	3.3e5
1993	3.1e5	3.1e5	3.2e5	3.3e5	3.8e5	3.9e5	3.9e5	4.0e5	4.1e5	3.7e5	3.3e5	3.2e5

1994	3.1e5	3.3e5	3.2e5	3.4e5	3.7e5	3.9e5	3.9e5	4.2e5	3.9e5	3.3e5	3.4e5	3.2e5
1995	3.0e5	3.3e5	3.4e5	3.4e5	3.6e5	3.8e5	3.9e5	4.1e5	4.2e5	4.2e5	3.4e5	3.0e5
1996	2.8e5	2.8e5	2.9e5	3.0e5	3.1e5	3.3e5	3.4e5	3.7e5	3.8e5	3.9e5	3.3e5	3.0e5
1997	2.9e5	2.9e5	2.9e5	3.1e5	3.3e5	3.3e5	3.7e5	3.9e5	3.8e5	3.6e5	3.3e5	3.0e5
1998	3.0e5	3.1e5	3.3e5	3.4e5	3.3e5	3.3e5	3.8e5	3.9e5	4.0e5	4.0e5	3.2e5	3.0e5
1999	2.8e5	2.7e5	2.6e5	2.8e5	3.0e5	3.4e5	3.4e5	3.5e5	3.6e5	3.5e5	3.3e5	3.4e5
2000	3.1e5	3.1e5	3.1e5	3.7e5	3.7e5	3.8e5	3.8e5	3.7e5	3.7e5	3.6e5	3.0e5	3.1e5
2001	3.0e5	2.8e5	2.7e5	2.7e5	3.0e5	3.1e5	3.3e5	3.6e5	3.5e5	3.5e5	3.4e5	3.2e5

This table indicates the population of a particular city.
From the data you may notice that the winter population is usually smaller than the summer population. Apparently, many citizens flee the city during the cold winter.
You may use the data as given in the table as initializers of a two-dimensional array or you may read them in from a file population.txt available on BB.

You are asked to calculate:

- The all-time high and the all-time low in the table. Indicate in which column(s) and row(s) these occur.
- The average of the population for each of the years 1990 - 2001
- The average of the population for each of the months Jan. - Dec.
- The average over all the given years and months.

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