

Assignment #4

1. Write a FORTRAN program to read the elements of a one-dimensional array (as one line) Containing N elements from data file named IN1, where $N \leq 10$. Then perform the following:
 - a. Print Maximum of the positive elements MAXP and his number NP as following format:
 MAXIMUM OF POSTIVE IS XXX.X AND ITS NUMBER XX
 - b. Print Minimum of the negative elements MINN and his number NN as following format:
 MINMUM OF NEGATIVE IS XXX.X AND ITS NUMBER XX
 - c. Number of zero elements as the following format:
 NUMBER OF ZERO IS XX

2. Write a FORTRAN program to read N elements in a one-dimensional array A, and N Elements in a one-dimensional array B, where $N \leq 12$, then calculate the array C, D, E as Following:
 $c_i = a_i + b_i$ $d_i = 2a_i - b_i$ $e_i = \text{Maximum of } c_i \text{ and } d_i$ Where $i=1, 2, \dots, N$
 Then print the values of C, D , E in three vertical columns in the output file named OUT2.

3. The rainfall in Saudi Arabia for the three months in four regions is tabulated as follows:

	'NORTH'	'EAST'	'SOUTH'	'WEST'
'January'	A ₁₁	A ₁₂	A ₁₃	A ₁₄
'February'	A ₂₁	A ₂₂	A ₂₃	A ₂₄
'March'	A ₃₁	A ₃₂	A ₃₃	A ₃₄

Write a FORTRAN program that performs the following:

- a. Read a two-dimensional array named A having the value of rainfall, also read one-dimensional array named MONTH having names of three months with 10 characters capacity, also read one-dimensional array named REGION having names of four regions with 6 characters capacity. All these arrays read from a data file called IN3.
 - b. Print the Maximum rain fall as this format :
 THE MAXIMUM RAIN FALL IS XXX.X IN REGION CCCCC IN MONTH CCCCCCCC
 - c. Calculate the average rainfall of all region had rainfall more than 10. And print as following:
 THE AVERAGE RAIN FALL FOR THE REGION HAD MORE THAN 10 IS XXX.X
 - d. Write the results of part b and c in an output file named OUT3.
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4. Assume that square matrix A have dimensions (NxN) where $N \leq 10$. Write a FORTRAN program performing the following:
 - a. Calculate elements of the matrix according to this formula: $a_{ij} = \frac{X}{i+j-1}$ $\forall ij$
 - b. Print the average of the diagonal elements.
 - c. Print the average of the upper diagonal elements.
 - d. Print the average of the lower diagonal elements.
 - e. Print the maximum of the three average.
 - f. Write the result in a data file named OUT4.