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GS543 Tutorial 5 Fortran Arrays Exercises

Single dimension Array

1) Write down a Fortran program to choose maximum, minimum and mean values from one dimensional array?
2) Write down a Fortran program to sorting one dimensional array? Hint: sorting refers to arranging data in ascending or descending order
3) Write a Fortran program to find the mean and standard deviation of n Number?

Hint: mean= $\frac{\sum_{i=1}^{n} a_i}{n}$ where a_i be the n numbers

Standard deviation= $\sqrt{\left(\frac{\sum_{i=1}^{n} a_i^2}{n} - (mean)^2\right)}$

4) **Numerical differentiation:** Consider the following function F(x) defined at the following point

	1	2	3	4	5	6
x	0.1	0.2	0.3	0.4	0.5	0.6
F(x)	1.7	1.92	1.94	1.97	2.214	2.32

$f'_i = \frac{f_{i+1} - f_i}{x_{i+1} - x_i}$

Multi-dimension Array

5)Write a Fortran Programs-

- To display the transpose of the given matrix?
- To find row sums of M X N matrix?
- To find the sum of the diagonal entries of square matrix?
- To subtract matrix A from another matrix B of the same order?
- To find the sum of the diagonal entries of square matrix?
- To find the number of positive number of M X N matrix?

① ② → $\begin{bmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \end{bmatrix}$

$q = \begin{bmatrix} 10.2 \\ 20.1 \\ 0.0 \\ -10.1 \\ 30.6 \\ 40.5 \\ 50.6 \\ -20.2 \end{bmatrix}$ 8X1

385 → $\begin{bmatrix} 1 & 4 & 7 \\ 2 & 5 & 8 \\ 3 & 6 & 9 \end{bmatrix}$

⑥ → $\begin{bmatrix} -1 & 0 & 1 & 3 \\ -5 & 0 & 6 & 0 \end{bmatrix}$