High-Performance Computing

Laboratory 2:

Generating sparse matrix

Objective:

- learning sparse matrix storage formats

Tasks:

1. Create a working directory (eg lab_2) .
2. Basing on the previous program extend the procedures from gen_rand into a program that will generate a sparse matrix of the desired size and selected ranges of values (location and value of each element should be generated randomly within the selected limits - the value of the main diagonal in the range 1-2, the other values in the range 0-1, the distribution of elements - a non-zero main diagonal, the remaining elements evenly across the entire width of the matrix)
3. Create the sparse matrix with **k** non-zero elements in each row (**k** as a parameter to the procedure, possibly inflicted as a percentage of the size of the matrix)
4. Record created matrix in a chosen format – CRS or CCS.
5. Validate the results (write test procedure comparing the contents of two arrays - saved as standard and in one of the selected formats, writing an error message if there are inconsistencies).