

Experiment - 5

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* **Aim** - Exercise to find the reduced row echelon form of matrix in Scilab.

* **Equipment** -

Reduced row echelon form

A computer with Scilab installed

* **Procedure** -

Reduced row echelon form of a matrix is used to find the rank of matrix and further allow solving a system of linear equations. A matrix is a row echelon form if -

- All row consisting of only zeros are at bottom
- The first non-zero element of a non zero row is always strictly to the right of the first non zero element of the row above it.

A matrix can have several row echelon form.

A matrix is in reduced Row echelon form if

- It is in row echelon form
- The first non zero element in each non zero row is a 1.
- Each column containing a non zero 1 has zeros in all its other entries

* **Rank of Matrix**

The rank of the matrix is the number of non zero rows in the row echelon form. To find the rank we need to perform the following steps.

- Find the row echelon form of the matrix
- Count the number of non-zero rows.

Code -

$A = \begin{bmatrix} 1 & 5 & 8 & 6 \\ 0 & 4 & 8 & 3 \\ 5 & 8 & 4 & 6 \end{bmatrix} J;$

$\text{rref}(A)$

1	5	8	6
0	4	8	3
5	8	4	6

$\text{diag}(\text{size}(A), \text{'The row reduced echelon form of matrix A is'})$

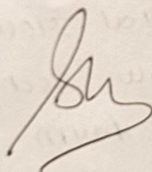
1	0	0
0	1	0
0	0	1

"The row reduced echelon form of the matrix A is"

$\text{rank}(A)$

ans =

3.



* Conclusion

This experiment provided a fundamental understanding of finding row reduced echelon form and rank of matrix in Matlab. It can also be used as a way of finding a solution to the system of linear equations.