Experiment - 5

* Aim- Exercises 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-zeros elements of a non zero row is always ~~sticky~~ to the right of the first non zero elements 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 nonzero elements in each nonzero row is a 1.
- Each column containing a nonzero at 1 has zeros in all its other entries

* Rank of Matrix

The rank of the matrix is the number of non zeros 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 = [1 5 8 6; 0 4 8 3; 5 8 4 6];
rref(A)
    1.    5.    8.    6.
    0.    4.    8.    3.
    5.    8.    4.    6.
disp(sprintf('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"
rank(A)
ans =
    3.
```

* Conclusion

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