**PROJECT DEFINITION**

* In this project you will implement a MATLAB program that will do the following.

1. Read relevant data of a power system with n number of buses.
2. Construct the complex bus admittance matrix (YBUS) as well as the sparse form of if (YBUS\_SPARSE).
3. Using YBUS and forward/backward substitution determine ZBUS.

The inputs and outputs of the program are given at the end of the document.

* The sample input data file is named **ieee118Bus.xlsx.** There are two sheets in the file where the first sheet consists of bus data and the second sheet shows line data. All the values are given in per unit system. Taps are located at **From Bus** side.
* Write a report which includes the following:
  1. The sparsity pattern plots for YBUS (use *spy(.)* function).
  2. Number of elements used to store the same YBUS matrix as a ‘sparse structure’.
  3. Implementation details.
* Inputs and outputs of your code should be as follows:
  + **Inputs:** ieee118Bus.xlsx file path
  + **Outputs:** non-zero entries of the 26th Column of YBUS, first 5 entries of the 26th row of ZBUS