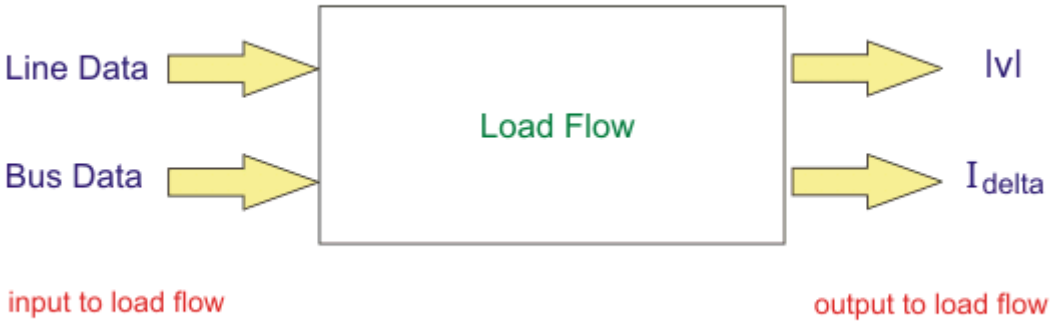
Load Flow Study with Newton Raphson Method on IEEE 14 and 30 Bus systems. Simulation in MATLAB.

Load Flow Analysis is the computational procedure (numerical algorithms) required to determine the steady state operating characteristics of a power system network from the given line data and bus data. It is an important tool involving numerical analysis applied to a power system. A load flow study uses simplified notation such as a one-line diagram and per-unit system, and focuses on various form of AC power (reactive, real and apparent) rather than voltage and current.



To solve the power flow problem, we use The Newton Raphson method. This method needs less number of iterations to reach convergence, and takes less computer time hence computation cost is less and the convergence is certain. Procedures like forming Y bus, Jacobian matrix and calculating scheduled errors are carried out to calculate the power flow. MATLAB as a high-performance language for technical computation integrates calculation, visualization and programming in an easy-to-use environment, thus becomes a standard instructional tool for introductory and advanced courses in mathematics, engineering

and science in the university environment. Therefore, a MATLAB program is used for IEEE 14 and 30 bus system with standard IEEE 14 and 30 bus system data input files. In this project, we study the MATLAB programming, identify an appropriate command, build the program for the power flow analysis using M-files and then run simulation of power flow analysis using MATLAB for small, medium and large-scale system. After simulating the program, it displays results, that is, voltage, active and reactive powers and line losses.

Flow chart of the project: -