Assignment

Write a code in MATLAB that will

1. Take system data in the prescribed format (see next page)

2. Obtain bus admittance (Y_{bus}) matrix of the given system.

3. Carry out Newton-Raphson Load Flow on the given system by
(i) Computing the mismatch vector and jacobian matrix in each iteration
(ii) Finding the correction vector. (Do not invert the jacobian matrix, instead use Gaussian Elimination).
(iii) Updating the variables and checking for convergence

4. After convergence, print the following in the workspace
(a) Bus voltage magnitude (p.u.) and angle (deg),
(b) Active and reactive power injections at all the buses
(c) Reactive power generation at the P-V buses
(d) The complex power flow through the lines (both from sending end and from receiving end)

- **The code should be general so that it can accept and work with data for system of any size (provided given in the prescribed format).**
- **Data of a 2-machine, 6-bus power system systems is provided in the next page to show the format.**
- **Please stick to the variable names specified in order to maintain uniformity.**

Six-bus system data

General Data:
No of buses (variable name 'nbs'): 6;
No of machines (variable name 'nmc'): 2

Bus data (variable name 'bus_dat'):

Bus No.	Bus type	Voltage (p.u.)	Angle (deg)	P_g (MW)	Q_g (MVAR)	P_L (MW)	Q_L (MVAR)
1	101	1.00	0	0	0	0.55	0.13
2	101	1.00	0	0	0	0	0
3	101	1.00	0	0	0	0.30	0.18
4	101	1.00	0	0	0	0.50	0.05
5	102	1.03	0	0.75	0	0.30	0.10
6	103	1.02	0	0	0	0	0

101: P-Q bus; 102: P-|V| bus; 103: |V|-θ bus

Branch data ('line_dat'):

From bus	To bus	Resistance r (p.u.)	Reactance x (p.u.)	Line Charging B (p.u.)	ONR
6	2	0.080	0.370	0.280	1.000
6	4	0.123	0.518	0.400	1.000
5	1	0.723	1.050	0.200	1.000
5	3	0.282	0.640	0.300	1.000
2	4	0.097	0.407	0.240	1.000
2	1	0.0	0.133	0.000	1.050
4	3	0.0	0.300	0.000	1.025