Consider the 5-bus power network shown bellow,
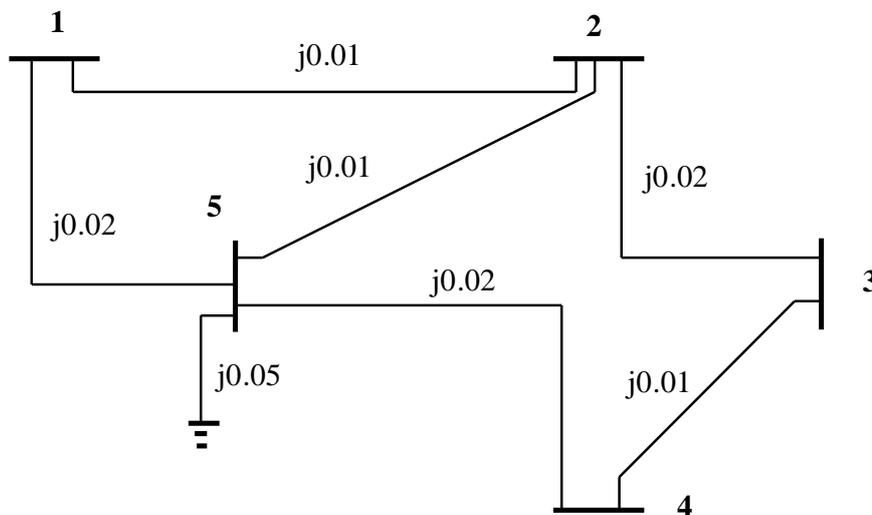


5-bus network, all impedances are in per unit

Use the Chained Data Structure Method (row fashion approach; STO, IC, NX, and NFIRST) for storing and modifying the following:

a) Bus admittance matrix referenced to bus "0" using the building algorithm.
b) Bus impedance matrix referenced to bus "0" using the building algorithm.
c) Check if multiplication of the bus admittance matrix and bus impedance matrix result into the identity matrix.
d) Consider the addition of a new line between buses 3 and 5 with line impedance of j0.5 per-unit. Modify the bus admittance matrix only.
e) Consider the modification of part (d), remove bus 4. Modify the bus admittance matrix only.