Example: Load bus no. 2, which is part of simple 2-bus network, has injected powers described by following non-linear equations:

$$P_2 = 10|U_2||U_1|\cos(106.26° - \theta_2 + \theta_1) + 10|U_2|^2 \cos(-73.74°)$$
$$Q_2 = -10|U_2||U_1|\sin(106.26° - \theta_2 + \theta_1) - 10|U_2|^2 \sin(-73.74°)$$

in pu.

Bus no. 1 is the slack bus with $\overline{U}_1 = 0.98\angle 0°$ pu , active and reactive power consumption in PQ bus is 1.5 pu and 0.5 pu (with base power of 100 MVA). By using the Newton-Raphson method get both voltage magnitude and phase angle in the PQ bus. Start with nominal initial guess. Do only first three iterations.

[Solution: $\overline{U}_2 = 0.86425\, e^{-j8°49'45.41''}\, pu$]