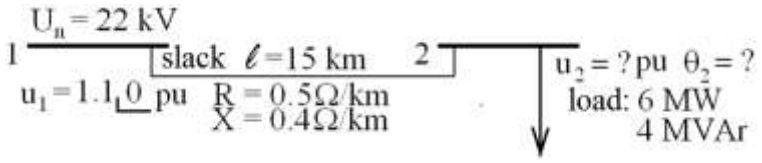
Example: Calculate the voltage magnitude and the voltage phase angle in bus no. 2 by using the G-S method after first 2 iterations. Base power S_V equals 100 MVA, round the results on 5 decimal places, start with nominal voltage magnitude and zero phase angle in bus no. 2.



Calculation:

$$\underline{y}_{12} = \frac{R - jX}{\left(R^2 + X^2\right)l}\frac{U_V^2}{S_V} = 0.393496 - j0.314797\ pu$$

Admittance matrix:

$$\underline{A} = \begin{bmatrix} 0.393496 - j0.314797 & -0.393496 + j0.314797 \\ -0.393496 + j0.314797 & 0.393496 - j0.314797 \end{bmatrix} pu$$

Formula of the G-S method:

$$\overline{U}_2^{(p+1)} = \frac{1}{\overline{A}_{22}}\left[\frac{P_2 - jQ_2}{\overline{U}_2^{(p)*}} - \overline{A}_{21}\overline{U}_1\right] =$$

$$= \frac{1}{0.393496 - j0.314797}\left[\frac{-0.06 + j0.04}{\overline{U}_2^{(p)*}} + \left(0.393496 - j0.314797\right)1.1\angle 0°\right]$$

First two iterations are shown in the table below:

it	U_2	θ_2	deviation
0	1.0	0.0°	---
1	0.957518	-0°44'	0.04248
2	0.951022	-0°39'	0.006496