

Ejemplo Gauss Seidel

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A

Scribe

$$A = \begin{bmatrix} 6 & 18 & 3 \\ 2 & 12 & 0 \\ 4 & 15 & 3 \end{bmatrix} \quad b = \begin{bmatrix} 3 \\ 19 \\ 0 \end{bmatrix} \quad x = \begin{bmatrix} x_1 \\ x_2 \\ x_3 \end{bmatrix} \quad \begin{matrix} x_1^0 = 0 \\ x_2^0 = 0 \\ x_3^0 = 0 \end{matrix}$$

$$x_1^{k=1} = - \sum_{j=1}^n a_{1j} x_j^0 + b_1 = - (a_{12} x_2^0 + a_{13} x_3^0 + b_1)$$

$$- (18(0) + 3(0)) + 3 = 3 = \frac{1}{2}$$

$$x_2^{k=1} = - (a_{21} x_1^0 + a_{23} x_3^0 + b_2) = - (2(0) + 0(0)) + 19 = \frac{18}{12} = \frac{3}{2}$$

$$x_3^{k=1} = - (a_{31} x_1^0 + a_{32} x_2^0 + b_3) = - (4(0) + 15(3/2)) + 0 = - \frac{49}{6} = -8.16$$

Segunda iteración

$$x_1^{k=2} = - (18(3/2) + 3(-49/6)) + 3 = \frac{1}{12} = 0.083$$

$$x_2^{k=2} = - (2(1/12) + 0(-49/6)) + 19 = \frac{113}{72} = 1.5694$$

$$x_3^{k=2} = - (4(1/12) + 15(113/72)) + 0 = - \frac{191}{24} = -7.95$$

Tercera iteración

$$x_1^{k=3} = - (18(113/72) + 3(-191/24)) + 3 = - \frac{11}{48} = -0.229$$

$$x_2^{k=3} = - (2(-11/48) + 0(-191/24)) + 19 = \frac{467}{288} = 1.621$$

$$x_3^{k=3} = - (4(-11/48) + 15(467/288)) + 0 = - \frac{749}{96} = -7.80$$