Calcolo di autovalori

$$A = \begin{pmatrix} 1 & 2 & 1 \\ 0 & 1 & 3 \\ 2 & 1 & 1 \end{pmatrix}$$

$$p(\lambda) = \det(A - \lambda I) = \det \begin{pmatrix} 1-\lambda & 2 & 1 \\ 0 & 1-\lambda & 3 \\ 2 & 1 & 1-\lambda \end{pmatrix} =$$

$$= (1-\lambda)^3 + 12 - 2(1-\lambda) - 3(1-\lambda) = -(\lambda^3 - 3\lambda^2 - 2\lambda - 8)$$

$\lambda_1 = 4$

	1	−3	−2	−8
4		4	4	8
	1	1	2	//

$$p(\lambda) = -(\lambda - 4)(\lambda^2 + \lambda + 2)$$

$$\lambda_2 = \frac{-1 - i\sqrt{7}}{2}, \quad \lambda_3 = \frac{-1 + i\sqrt{7}}{2} \qquad |\lambda_2| = |\lambda_3| = \sqrt{2}$$

Gerschgorin: $\gamma = \gamma_i = \{ z \in \mathbb{C} : |z - 1| \leq 3 \}$

$$|\lambda_2 - 1| = |\lambda_3 - 1| = \left| \frac{-1 \pm i\sqrt{7}}{2} - 1 \right| = \left| -\frac{3}{2} \pm i\frac{\sqrt{7}}{2} \right| = 2 < 3$$