> # We doen de uitdagende bijvraag niet aangezien dit wordt geskipped door professor.

> restart : with(LinearAlgebra) :

> $A := Matrix\left(\left[\left[\frac{8}{10}, \frac{3}{10}\right], \left[\frac{2}{10}, \frac{7}{10}\right]\right]\right)$

$$A := \begin{bmatrix} \frac{4}{5} & \frac{3}{10} \\ \frac{1}{5} & \frac{7}{10} \end{bmatrix} \quad (1)$$

> $J, Q := JordanForm(A, output = ['J', 'Q'])$

$$J, Q := \begin{bmatrix} 1 & 0 \\ 0 & \frac{1}{2} \end{bmatrix}, \begin{bmatrix} \frac{3}{5} & \frac{2}{5} \\ \frac{2}{5} & -\frac{2}{5} \end{bmatrix} \quad (2)$$

> # $Lambda_1 = 1, lam_2 = \frac{1}{2}$, obviously gaat lambda_1 domineren wanneer we exponentieele vorm nemen.

> # Aka, $v_1 = \left[\frac{3}{5}, \frac{2}{5}\right]$ is het asymptotische vector. Let's proof this shit

> $JK := Matrix\left(\left[[1, 0], \left[0, \left(\frac{1}{2}\right)^k\right]\right]\right)$

$$JK := \begin{bmatrix} 1 & 0 \\ 0 & \left(\frac{1}{2}\right)^k \end{bmatrix} \quad (3)$$

> $result := Q \cdot JK \cdot MatrixInverse(Q)$

$$result := \begin{bmatrix} \frac{3}{5} + \frac{2\left(\frac{1}{2}\right)^k}{5} & \frac{3}{5} - \frac{3\left(\frac{1}{2}\right)^k}{5} \\ \frac{2}{5} - \frac{2\left(\frac{1}{2}\right)^k}{5} & \frac{2}{5} + \frac{3\left(\frac{1}{2}\right)^k}{5} \end{bmatrix} \quad (4)$$

> # In this form, we can see if k -> infinity, then we get the answer we were looking for. Prove accepted.

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