Data 605 Week 3 Discussion

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September 11, 2018

Excercise C10:
Find the characteristic polynomial of the matrix:

$$A = \begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}$$

Substract the identity matrix from A

$$\begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix} - \begin{bmatrix} \lambda & 0 \\ 0 & \lambda \end{bmatrix} = \begin{bmatrix} 1-\lambda & 2 \\ 3 & 4-\lambda \end{bmatrix}$$

Now solving the equation:

$$P_A x = (1-\lambda)(4-\lambda)-(2)(3) = 4-\lambda-4\lambda+\lambda^2-6 = 4-5\lambda+\lambda^2-6 = \lambda^2-5\lambda-2$$