M'sila University
Fcaulty of Mathematics and Computer
Department of Mathematics
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TD Number 2

Exercise 1.
Diagonalize the following matrices:

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

Exercise 2.
Find the triangular matrix T similar to A where

- $A = \begin{bmatrix} 4 & 3 & 4 \\ 0 & 1 & 0 \\ -1 & -1 & 0 \end{bmatrix}$
- $A = \begin{bmatrix} 3 & -4 & 0 & 2 \\ 4 & -5 & -2 & 4 \\ 0 & 0 & 3 & -2 \\ 0 & 0 & 2 & -1 \end{bmatrix}$

Exercise 3.
Using the Hamilton-Cayley theorem, find the inverse of the matrix

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