

EE 640 - HW2

Note Title

21-08-2008

1) Evaluate the series $\exp(At)$ for:

a) $A = \begin{bmatrix} 0 & 1 \\ 0 & 0 \end{bmatrix}$ (b) $A = \begin{bmatrix} 0 & 1 \\ -1 & 0 \end{bmatrix}$

c) A matrix with ones on the first super diagonal and zeroes everywhere else

d) A matrix with λ 's on the diagonal, ones on the first super-diagonal and zeroes everywhere else.

e) A matrix A such that $A^k = 0$ for some $k \geq 2$ (called nilpotent matrix)

f) $A = \text{block diag} \{A_1, \dots, A_N\}$

2) If $\bar{A} = T^{-1}AT$, show that $\bar{A}^k = T^{-1}A^kT$ and that $\exp(At) = T[\exp(\bar{A}t)]T^{-1}$