

IGEE-UMBB  
EE 174: Recitation set 9

- \* 1. Determine the rank and nullity of

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

- \* 2. Compute the inverse, if it exists, of the following matrices:

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

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

- \* 3. Consider the system of linear equations

$$x + y + z = 2$$

$$x + 3y + 3z = 0$$

$$x + 3y + 5z = 2$$

- Convert the augmented matrix  $(A \ b)$  to row echelon form
- Does the system have a solution?
- What is the new system of equations? Comment.

- \* 4. Solve when possible the following systems:

a)  $3x - 2y + z = 4$

$$-2x + y - 3z = 0$$

$$4x - 5y + 8z = -3$$

b)  $x - 2y + z = 1$

$$2x - 3y + z = 0$$

$$-3x + 2y + 3z = 1$$

$$x + y - 2z = 0$$