QUIZ October 21, 2013

1. Suppose

$$A = \begin{bmatrix} 1 & 2 & 3 \\ 1 & 2 & 1 \\ 1 & 0 & 0 \end{bmatrix}, \quad \mathbf{v} = \begin{bmatrix} 1 \\ 1 \\ 1 \end{bmatrix}.$$

Then $\mathbf{v}$ is in the nullspace of A. (Hint: don't do row reduction! It's easier than that.)

2. Suppose

$$A = \begin{bmatrix} 1 & 2 & 3 \\ 1 & 2 & 1 \\ 1 & 0 & 0 \end{bmatrix}, \quad \mathbf{v} = \begin{bmatrix} 1 \\ 1 \\ 1 \end{bmatrix}.$$

Then $\mathbf{v}$ is in the columnspace of A. (Hint: don't do row reduction! It's easier than that.)

3. The nullspace and columnspace are always subspaces of the same vector space.

4. A vector $\mathbf{v}$ is in the columnspace of a matrix A if and only if the matrix equation $A\mathbf{x} = \mathbf{v}$ is consistent.

5. If T is the linear transformation associated to a matrix A, then the kernel of T is another word for the nullspace of A.

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