MATLAB: University of California, Davis

Computer LAB for Linear Algebra Dr. Daddel

MATH 22AL LAB # 6

4 Background, Reading Part :

4.2 Row space, Column space, Null space

Definition : The vector space spanned by the row of $A_{m\times n}$ is a subspace of R^n and is called **Row space of** A and is denoted by $row(A)$.

Note: For some matrices the row space of A is R^n and for some it is not.

Definition : The vector space spanned by the columns of A is a subspace of R^m and is called **th column space of** A **and is denoted by** $col(A)$**.**

Note: For some matrices the column space of A is R^m and for some it is not.

We are interested in studying $row(A)$ and $col(A)$. In particular we want to find bases for $row(A)$ and $col(A)$.

Note: Since column vectors of A are row vectors of $A^t = A'$ we will study the row space in more details. To study the column space of A we need to consider the row space of A^t.

Definition : There is also another subspace of R^n which we are interested to study. This subspace is the set of all solutions of the linear system $AX = 0$ and is called **null-space of A**. The Null space of A is denoted by $null(A)$ and is a subspace of R^n.