

# Some Experiments

Any non-trivial subspace has infinitely many points (a line, a plane, etc.) and so we can't characterize it by listing all of its members! Instead, we characterize it in one of two different ways:

**Linear Combo Representation:** As the set of all linear combos of a collection of vectors

**Restrictions Representation:** As a set of constraints that the components of the vectors must satisfy

Look first at the column space  $C(A)$ . By its very definition it is characterized by the linear combo representation.

**Ex:** Let  $A = \begin{bmatrix} 1 & 1 \\ 2 & 2 \end{bmatrix}$ . Then  $Ax = b$  implies that

$$b = x_1 \begin{bmatrix} 1 \\ 2 \end{bmatrix} + x_2 \begin{bmatrix} 1 \\ 2 \end{bmatrix}$$

where  $x_1$  and  $x_2$  are arbitrary real numbers.