LINEAR ALGEBRA

#12

VECTORS & LINEAR EQUATIONS: PART XII

Do Now: Fill in the blanks!

$\text{Span}(\vec{u}) = \mathbb{R}^1$

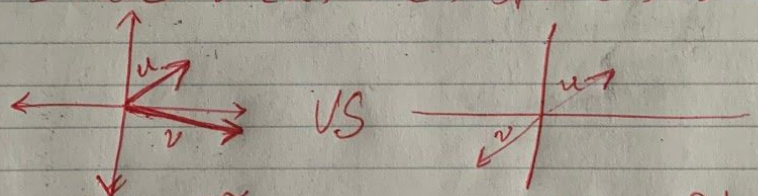
$\text{Span}(\vec{u}, \vec{v}) = \mathbb{R}^2$

$\text{Span}(\vec{u}, \vec{v}, \vec{w}) = \mathbb{R}^3$

LESSON: But, that is not always true. Today, we explore the outliers of linear combinations.

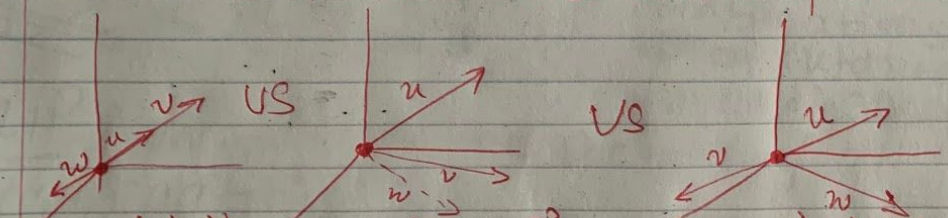
We begin from a geometric POV:

If I have $\vec{v} = c\vec{u}$, then $\text{span}(\vec{u}, \vec{v}) = \mathbb{R}^1$



$\text{Span}(\vec{u}, \vec{v}) = \mathbb{R}^2$ $\text{Span}(\vec{u}, \vec{v}) = \mathbb{R}^1$

We apply the same reasoning to a linear combination of 3 vectors:



$\text{Span}(\vec{u}, \vec{v}, \vec{w}) = \mathbb{R}^1$ $\text{span}(\vec{u}, \vec{v}, \vec{w}) = \mathbb{R}^3$ $\text{Span}(\vec{u}, \vec{v}, \vec{w}) = \mathbb{R}^2$

EXIT SLIP: What is the ~~[illegible]~~ span if $\vec{u} = \vec{v} = \vec{w}$?

$\text{Span}(\vec{u}, \vec{v}, \vec{w}) = \mathbb{R}^1$