CS/ECE/ME 532
Matrix Methods in Machine Learning

Welcome!

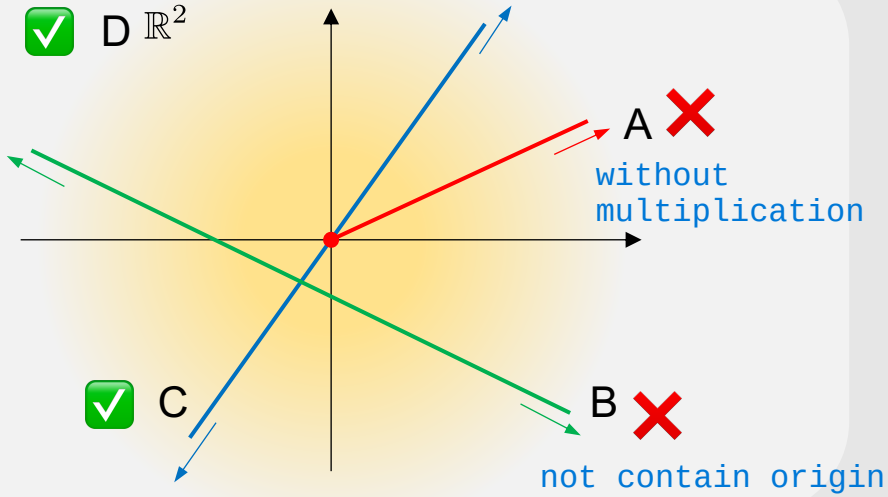
Activity 5

Subspaces

$S \subseteq \mathbb{R}^n$ is a subspace if:

1. $\mathbf{0} \in S$ *Contains the origin*
2. if $\boldsymbol{x}, \boldsymbol{y} \in S$ then $\boldsymbol{x} + \boldsymbol{y} \in S$ *Closed under addition*
3. if $\boldsymbol{x} \in S$ then $\alpha \boldsymbol{x} \in S$ *Closed under scalar multiplication*

equal to R^2



(lin indep vectors)

Bases/Tastes profiles

Users →

Movie ↓

$$\begin{bmatrix} 4 & 7 & 2 & 8 & 7 \\ 9 & 3 & 5 & 6 & 10 \\ 4 & 8 & 3 & 7 & 6 \end{bmatrix} \approx \begin{bmatrix} t_{1,1} & t_{1,2} \\ t_{2,1} & t_{2,2} \\ t_{3,1} & t_{3,3} \end{bmatrix} \begin{bmatrix} w_{1,1} & \dots & w_{1,5} \\ w_{2,1} & \dots & w_{2,5} \end{bmatrix}$$

weights of user 5's preference for taste 2

basis or taste vector 1

Question 3:
Do your work in Python

- `A.sum()`
- `A.reshape()`
- `A.T`
- `np.sqrt()`
- `np.ones()`
- `np.matmul()` `#or @`