Ch2 Definitions

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- Definition 2.10 Linear Combinations
  - a vector in form

$$\vec{w} = c_1\vec{v_1} + c_2\vec{v_2} + \cdots + c_n\vec{v_n}$$

(where $c_1, \ldots, c_n$ are scalars called coefficients of linear combination)

- Definition 2.11 Span of vectors

$$\text{Span}(\vec{v_1}, \ldots, \vec{v_n}) = \{c_1\vec{v_1} + \cdots + c_n\vec{v_n} \mid c_1, c_2, \ldots, c_n \in \mathbb{R}\}$$

Definition 2.12 GEOMETRIC definition of linear dependence and independence

- For at least one i $\Rightarrow$ Linear dependent.

$$\vec{v_i} \in \text{Span}(\vec{v_1}, \vec{v_2}, \ldots, \vec{v_{i-1}}, \vec{v_{i+1}}, \vec{v_n})$$

Definition 2.13 ALGEBRAIC definition of linear dependence

- Non-trivial solution to $\Rightarrow$ Linear dependent

$$c_1\vec{v_1} + \cdots + c_n\vec{v_n} = \vec{0}$$