Siddhardhan
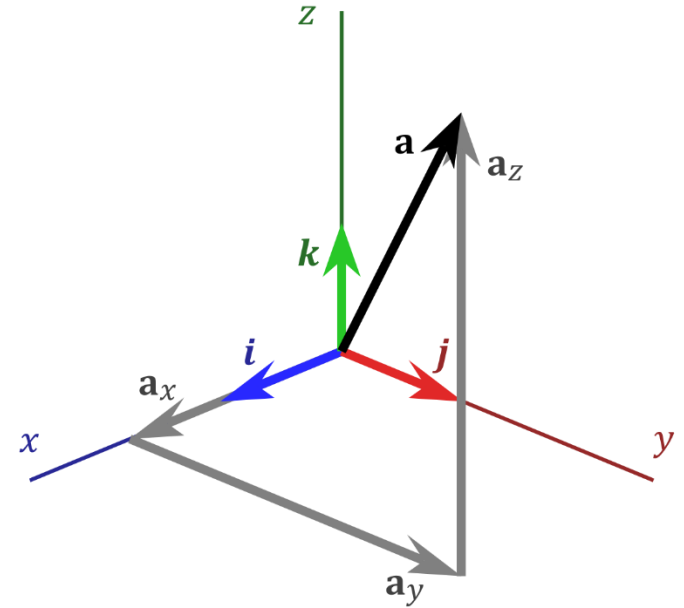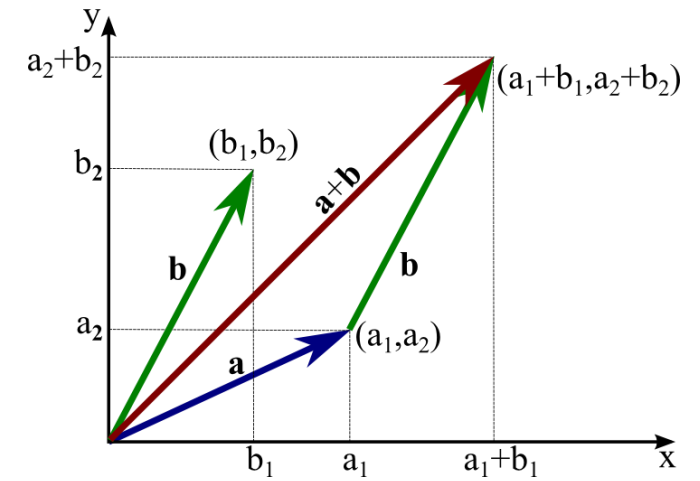
Vector Operations - Part 1

Math for Machine Learning

Vector Operations – Part 1

1. Vector Addition

2. Vector Subtraction

3. Multiplying a vector by a Scalar

4. Angle between 2 Vectors

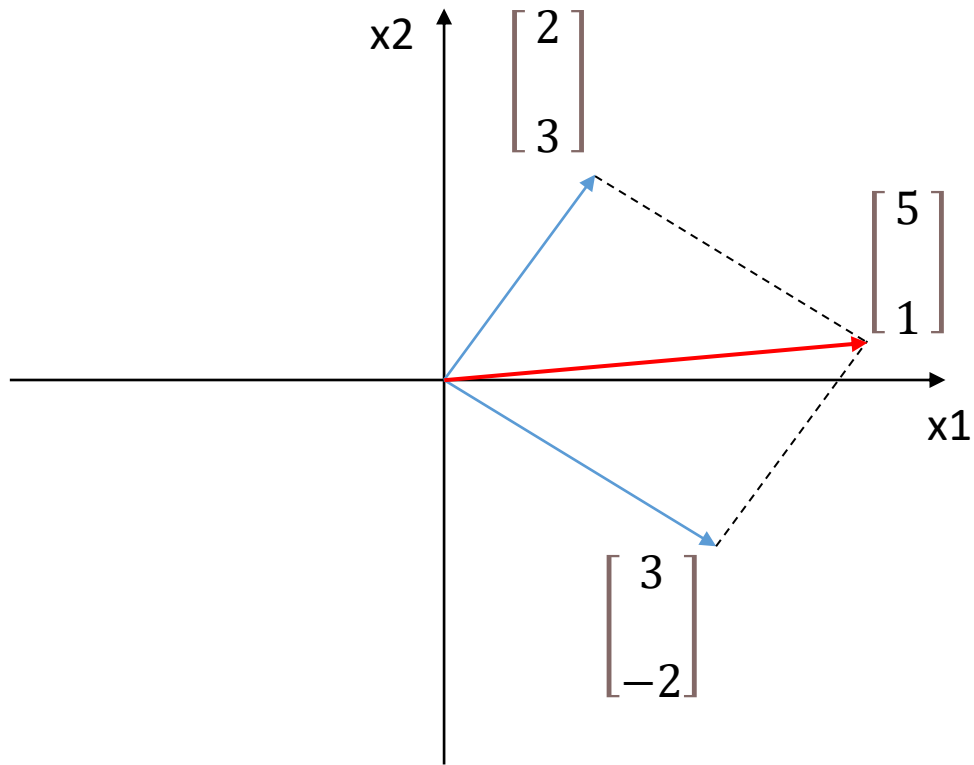# Vectors – Computer Science Approach

Scalar

24

Vector

$$\begin{bmatrix} 2 & -8 & 7 \end{bmatrix}$$

row

or column

$$\begin{bmatrix} -6 \\ -4 \\ 27 \end{bmatrix}$$

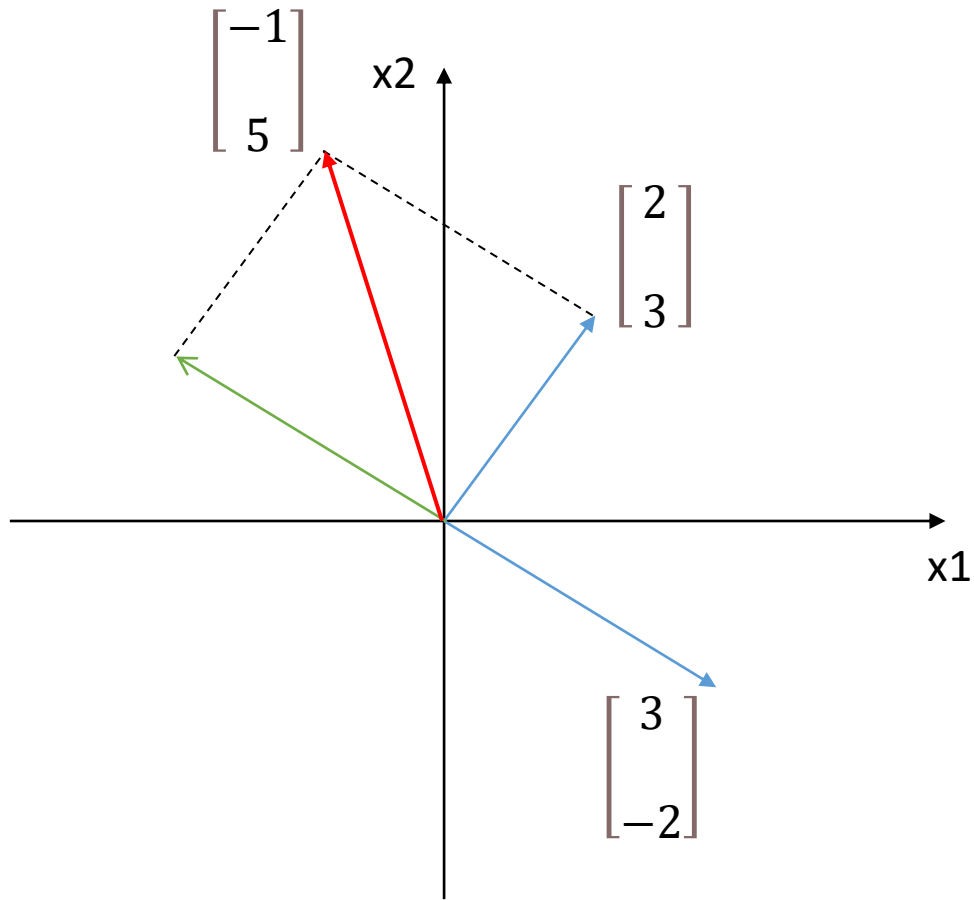$$\begin{bmatrix} 89 & 66 & 23 & 94 & 28.1 \end{bmatrix}$$

(Glucose, Blood Pressure, Skin Thickness, Insulin, BMI)

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Vector Addition

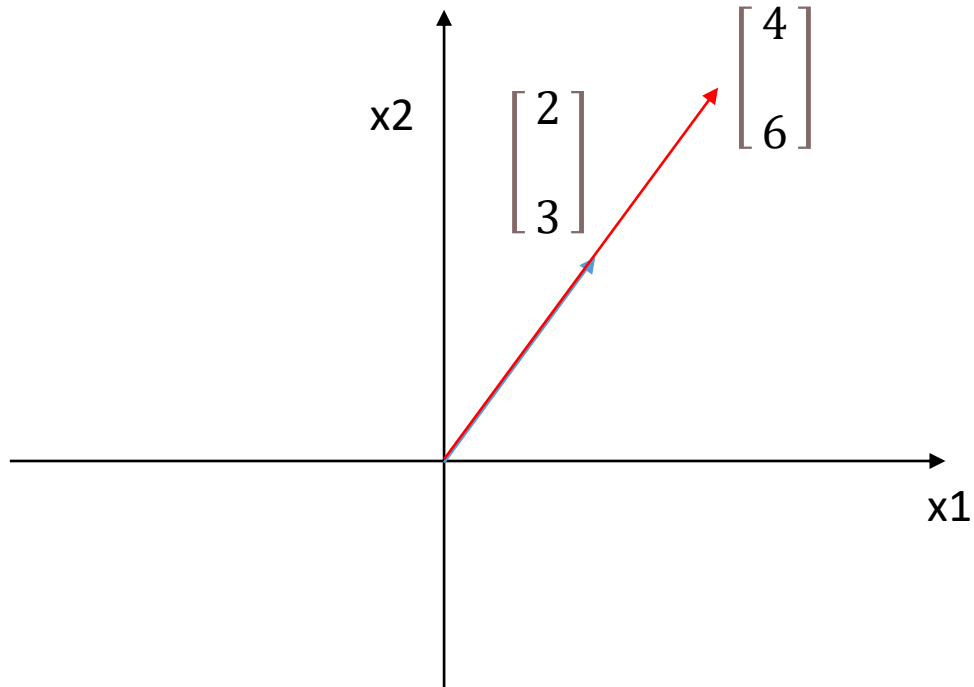$$\begin{bmatrix} 2 \\ 3 \end{bmatrix} + \begin{bmatrix} 3 \\ -2 \end{bmatrix} = \begin{bmatrix} 2+3 \\ 3+(-2) \end{bmatrix} = \begin{bmatrix} 5 \\ 1 \end{bmatrix}$$
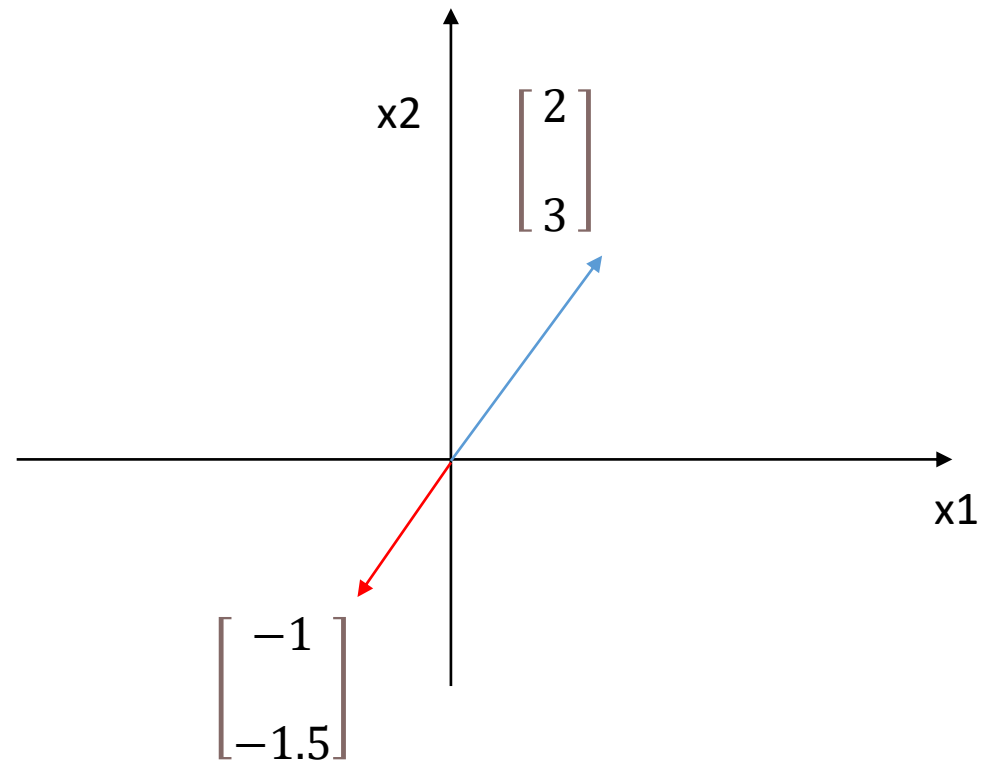
Vector Subtraction

$$\begin{bmatrix} 2 \\ 3 \end{bmatrix} - \begin{bmatrix} 3 \\ -2 \end{bmatrix} = \begin{bmatrix} 2-3 \\ 3-(-2) \end{bmatrix} = \begin{bmatrix} -1 \\ 5 \end{bmatrix}$$
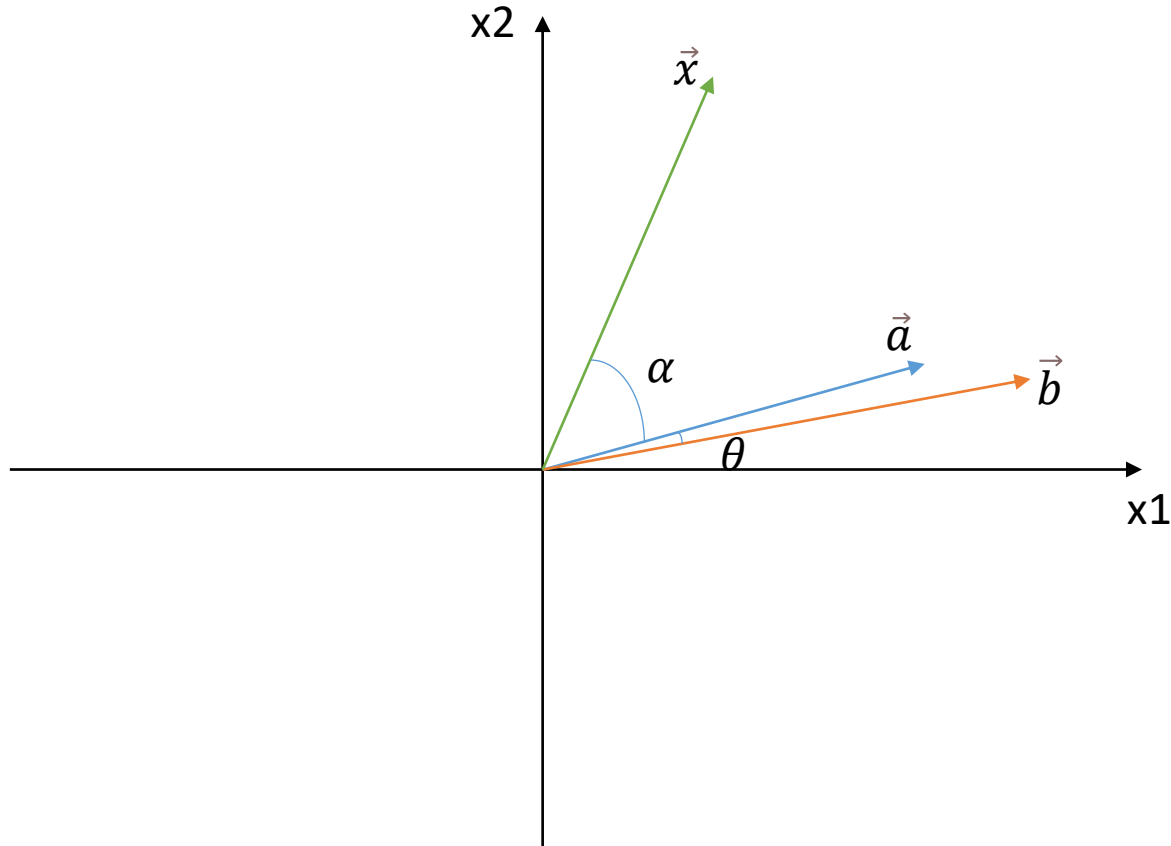
Multiplying a vector by a Scalar

$$2 \ \times \ \begin{bmatrix} 2 \\ 3 \end{bmatrix} \ = \ \begin{bmatrix} 4 \\ 6 \end{bmatrix}$$

$$-0.5 \ \times \ \begin{bmatrix} 2 \\ 3 \end{bmatrix} \ = \ \begin{bmatrix} -1 \\ -1.5 \end{bmatrix}$$

Angle Between 2 Vectors

Inference:

✓ If the angle between 2 vectors is small, then the 2 vectors are similar.

✓ If the angle between 2 vectors is large, then the 2 vectors are very different.

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