



Module 1 Lab 4 - Transforming data using linear algebra

Created	@June 5, 2025 5:44 PM
Class	IIITH
Event	Bootcamp
Subject	AI

In the standard coordinate system (Let us call it T0), the basis vectors are

$$i = \begin{Bmatrix} 1 \\ 0 \end{Bmatrix}$$

and

$$j = \begin{Bmatrix} 0 \\ 1 \end{Bmatrix}$$

We can use any two vectors as basis vectors for a new coordinate system as long as they are not colinear. For example, let us call this new coordinate system T1:

$$i = \begin{Bmatrix} 1 \\ -1 \end{Bmatrix}$$

and

$$j = \begin{Bmatrix} 0 \\ 2 \end{Bmatrix}$$

Suppose we have a point [a,b] in the T1 coordinate system. Its representation in the standard system T0 can be obtained by the following matrix multiplication:

$$\begin{Bmatrix} a' \\ b' \end{Bmatrix} = \begin{Bmatrix} 1 & 0 \\ -1 & 2 \end{Bmatrix} \begin{Bmatrix} a \\ b \end{Bmatrix}$$

where the columns of the matrix are the basis vectors of T1.