

# Assignment 1

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Download all python codes from

<https://github.com/YashasTadikamalla/EE3900/blob/main/Assignment1/codes>

and latex-tikz codes from

<https://github.com/YashasTadikamalla/EE3900/blob/main/Assignment1/Assignment1.tex>

## 1 PROBLEM (VECTORS Q2.24)

Find a unit vector in the direction of

$$\begin{pmatrix} 1 \\ 1 \\ -2 \end{pmatrix}.$$

## 2 SOLUTION

Given, a vector

$$\mathbf{a} = \begin{pmatrix} 1 \\ 1 \\ -2 \end{pmatrix} \quad (2.0.1)$$

$$\|\mathbf{a}\| = \sqrt{(1)^2 + (1)^2 + (-2)^2} = \sqrt{6} \quad (2.0.2)$$

To find: A unit vector along  $\mathbf{a}$ . Let it be  $\mathbf{u}$

We know, a unit vector  $\mathbf{n}$  along vector  $\mathbf{v}$  is given by

$$\mathbf{n} = \frac{\mathbf{v}}{\|\mathbf{v}\|} \quad (2.0.3)$$

Using (2.0.3),

$$\mathbf{u} = \frac{\mathbf{a}}{\|\mathbf{a}\|} \quad (2.0.4)$$

$$\therefore \mathbf{u} = \frac{1}{\sqrt{6}} \begin{pmatrix} 1 \\ 1 \\ -2 \end{pmatrix} \quad (2.0.5)$$

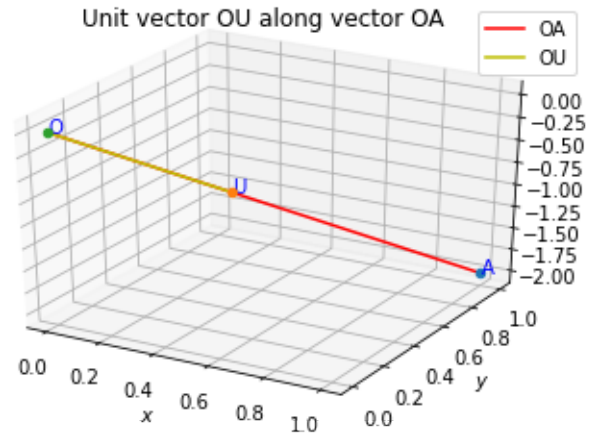


Fig. 0: Plot of vectors