# EE5609: Matrix Theory
# Assignment-1

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**Ques: Find a unit vector that makes an angle of 90°,135°,45°with positive X,Y and Z axis respectively.**

**Soln** : Given,

$$\implies \mathbf{m} = \begin{pmatrix} \cos 90^\circ \\ \cos 135^\circ \\ \cos 45^\circ \end{pmatrix} \tag{0.0.1}$$

we know that,

$$\mathbf{m} = \frac{\mathbf{m}}{\|\mathbf{m}\|}$$

Also, $\|\mathbf{m}\| = \sqrt{0^2 + (\frac{-1}{\sqrt{2}})^2 + (\frac{1}{\sqrt{2}})^2}$

$$\implies \|\mathbf{m}\| = 1 \tag{0.0.2}$$

Hence,from (0.0.1) and (0.0.2) we have the unit vector: $\mathbf{m} = \begin{pmatrix} 0 \\ \frac{-1}{\sqrt{2}} \\ \frac{1}{\sqrt{2}} \end{pmatrix}$