ASSIGNMENT-5

B.ANUSHA

Download all python codes from

https://github.com/BOJJAVOYINAANUSHA/Assignment5/blob/main/assignment5.py

and latex-tikz codes from

https://github.com/BOJJAVOYINAANUSHA/Assignment5/blob/main/ASSIGNMENT5.tex

1 QUESTION No-2.55 (Linear forms)

If **O** be the origin and the coordinates of **P** be $\begin{pmatrix}1\\2\\3\end{pmatrix}$, then find the equation of the plane passing through the point **P** and perpendicular to **OP**.

2 Solution

Given points $\mathbf{O} = \begin{pmatrix}0\\0\\0\end{pmatrix}$, $\mathbf{P} = \begin{pmatrix}1\\2\\3\end{pmatrix}$

The normal vector to the plane is **n** = **P** - **O**

$$\mathbf{n} = \begin{pmatrix}1\\2\\3\end{pmatrix} - \begin{pmatrix}0\\0\\0\end{pmatrix} \tag{2.0.1}$$

$$\mathbf{n} = \begin{pmatrix}1\\2\\3\end{pmatrix} \tag{2.0.2}$$

Equation of the plane is given by

$$\mathbf{n}^T(\mathbf{x} - \mathbf{P}) = 0 \tag{2.0.3}$$

$$\begin{pmatrix}1 & 2 & 3\end{pmatrix}\mathbf{x} = \begin{pmatrix}1 & 2 & 3\end{pmatrix}\begin{pmatrix}1\\2\\3\end{pmatrix} \tag{2.0.4}$$

$$\begin{pmatrix}1 & 2 & 3\end{pmatrix}\mathbf{x} = 14 \tag{2.0.5}$$

- Plot of the plane

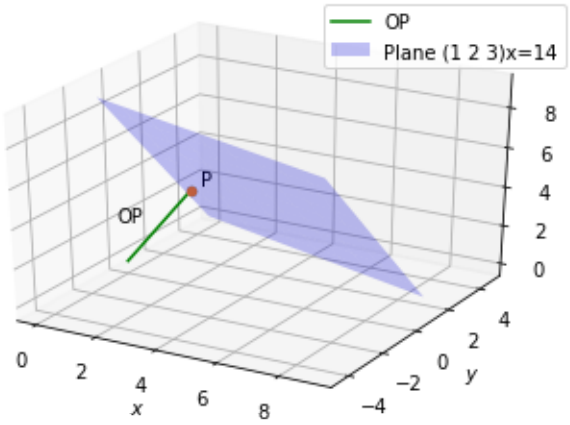

Fig. 2.1: Plot of the plane