

# Assignment 1

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**Abstract**—This document explains the concept of parallel planes by solving a problem.

Download the python code from

[https://github.com/Sairam13001/AI5006/tree/master/Assignment\\_1](https://github.com/Sairam13001/AI5006/tree/master/Assignment_1)

and latex-tikz codes from

[https://github.com/Sairam13001/AI5006/blob/master/Assignment\\_1/assignment\\_1.tex](https://github.com/Sairam13001/AI5006/blob/master/Assignment_1/assignment_1.tex)

## 1 PROBLEM

Find the distance between the two planes  $(2 \ 3 \ 4)\mathbf{x} = 4$  and  $(4 \ 6 \ 8)\mathbf{x} = 12$

## 2 EXPLANATION

If the two planes are of the form

$$\mathbf{n}^T \mathbf{x} = c_1 \quad (2.0.1)$$

and

$$\mathbf{n}^T \mathbf{x} = c_2 \quad (2.0.2)$$

Then the distance between the planes is given by :

$$\frac{|c_1 - c_2|}{\|\mathbf{n}\|} \quad (2.0.3)$$

## 3 SOLUTION

So, the distance between the given planes is:

$$\frac{|4 - 6|}{\sqrt{2^2 + 3^2 + 4^2}} = \frac{2}{\sqrt{29}} \quad (3.0.1)$$

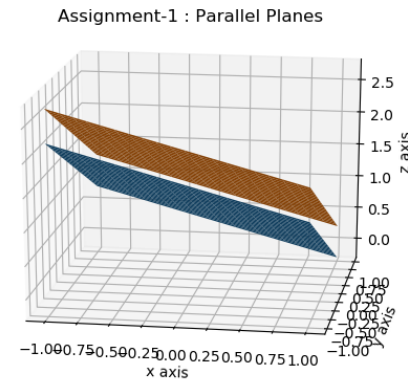


Fig. 0: Example of Two parallel planes