| Ex No: 02  Date: 14-08-2024 | Planar Data Classification using Neural Networks |
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Objective:

To build a neural network model to classify points from a dataset into two classes based on their coordinates using a planar data classification problem.

Descriptions:

Planar data classification is a type of binary classification problem where the task is to classify data points that lie on a 2D plane. This is a fundamental problem in machine learning and helps in understanding how neural networks can be applied to non-linear decision boundaries.

In this task, we aim to classify points based on their 2D coordinates (x1,x2)(x\_1, x\_2)(x1​,x2​) into two categories: one corresponding to label 1 (e.g., inside a circle) and the other to label 0 (e.g., outside the circle).

Neural networks are particularly powerful for such tasks because they can model complex non-linear decision boundaries. By applying a series of transformations using hidden layers, the neural network can learn to separate data that isn't linearly separable.

Model:

 Building the parts of the algorithm

Building the Neural Network Model

The main steps for building a neural network for planar data classification are:

1. Define the model structure:
   * Determine the number of layers and the number of units per layer.
2. Initialize the model's parameters:
   * Initialize weights and biases for each layer.
3. Loop until convergence:
   * Forward propagation: Compute the current loss by passing the input through the network.
   * Backward propagation: Calculate the gradients with respect to the parameters.
   * Update parameters: Adjust the parameters using gradient descent to minimize the loss.

This process is repeated iteratively until the model achieves satisfactory performance on the classification task.

GitHub Link:

<https://github.com/SudhanvaMS2004/Deep_Learning_Fundamentals/blob/main/Planar_data%20DISTRI.ipynb>