

CS 6301 - Machine Learning Lab - Week 5

Date: 02.09.24

TITLE : IMPLEMENTATION AND ANALYSIS OF ANN

TASKS

Program1:

In the perceptron shown in Figure 1, what will be the output of the perceptron if the input was (0,1) (1,1) and (1,0)? What if we change the bias weight to -0.5?

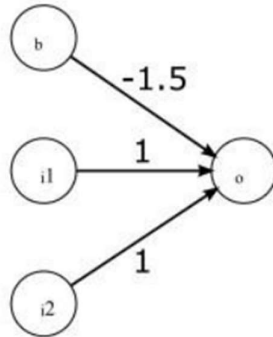


Figure 1: Perceptron

Record the output and your observation on the following:

Bias = -1.5			Bias = -0.5		
Input	Weighted sum	Output	Input	Weighted sum	Output
(0, 0)	-1.5		(0, 0)	-0.5	
(0, 1)	-0.5		(0, 1)	0.5	
(1, 0)	-0.5		(1, 0)	0.5	
(1, 1)	0.5		(1, 1)	1.5	

Program2:

A Single layer perceptron neural network is used to classify the 2 input logical gate OR shown in Figure 2. Using a learning rate of 0.1, train the neural network for the first three epochs. Use limiting function.

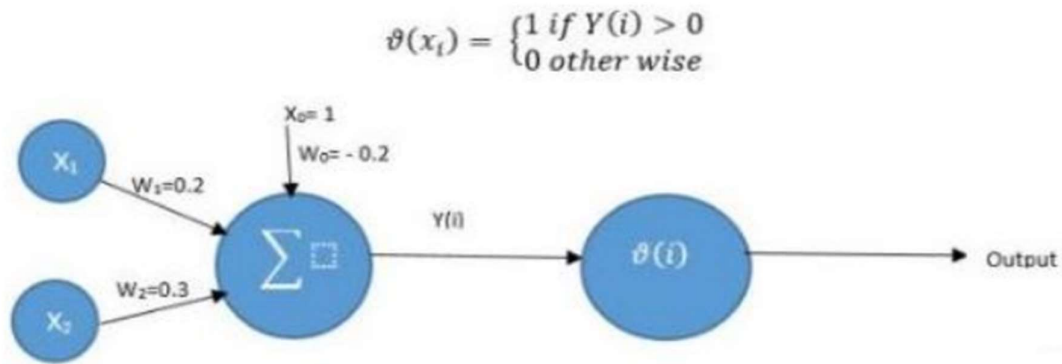


Figure 2: 2 input Logical Gate OR

Spot Question:

Create ANN classification model for Titanic survival data set

- **Survived:** Whether the passenger survived or not? 1=Survived, 0=Died
- **Pclass:** The travel class of the passenger
- **Sex:** The gender of the passenger
- **Age:** The Age of the passenger
- **SibSp:** Number of Siblings/Spouses Aboard
- **Parch:** Number of Parents/Children Aboard
- **Fare:** The amount of fare paid by the passenger
- **Embarked:** Port of Embarkation (C = Cherbourg; Q = Queenstown; S = Southampton)C

Create a Predictive model that can tell if a person will survive the titanic crash or not?

- Target Variable: Survived
- Predictors: 'Pclass', 'Sex', 'Age', 'SibSp', 'Parch', 'Fare' 'Embarked

Binary Classification

- Survived=0 The passenger died
- Survived=1 The passenger survived

Structure of ANN :

Two hidden layers, First has 10 neurons, and the second has 6 neurons. The output layer has one neuron. Which give the probability of class "1".

Hyper Parameters Tuning:

Parameters:

Units, Input dimensions, kernel_initializer, activation ,optimizer, batch_size and Epochs.

Choose any three combination of hyper parameters and find the best parameters combination out of it

Calculate the accuracy of the final trained model above on the testing data.