RISC – V PROJECT REPORT

(UE20EC303)

SIMULATION OF A BILAYER FEED FORWARD PERCEPTRON USING SYSTEM VERILOG

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Topic: simulation of a simple perceptron model

Abstract:

Perceptron is a linear classifier (binary). It helps to classify the given input data.

The perceptron consists of 4 parts:

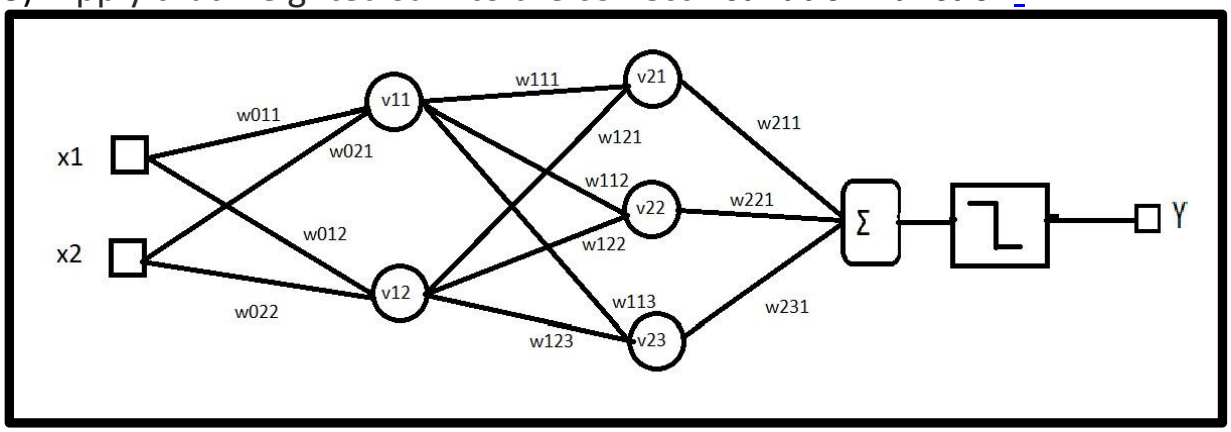
- Input values
- Weights and bias
- Net sum
- Activation function

How it works?

1)all inputs x are multiplied with their weights w. Lets call it k.

2) Add all the multiplied values and call them Weighted Sum.

3) Apply that weighted sum to the correct *Activation Function*.



IMPLEMENTATION:

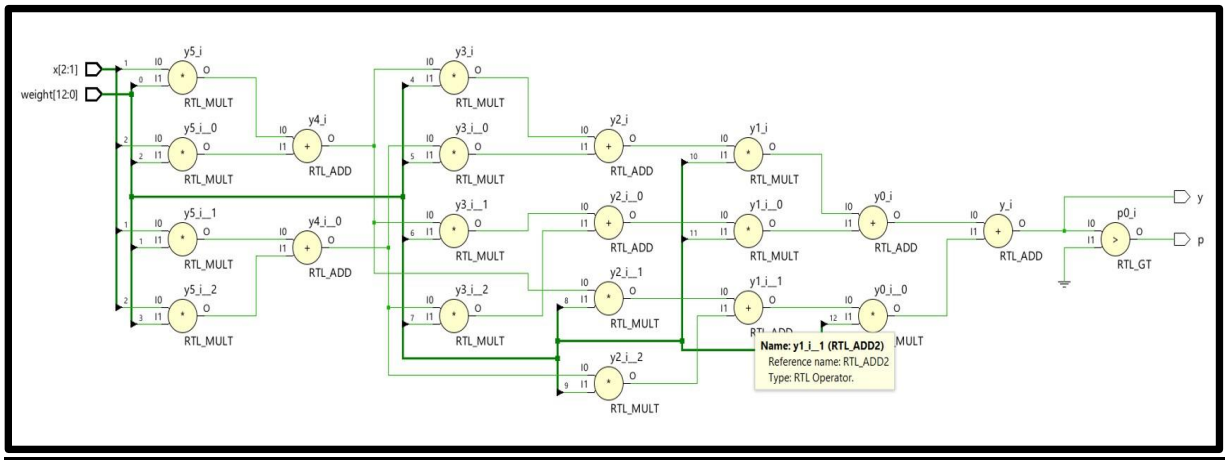
- The simulation was implemented using Verilog.
- The model of perceptron we considered has 2 layers in its hidden layer.

- The user inputs 2 binary values x1 , x2 and sets the binary weights of the hidden layer of the perceptron.
- All the multiplied values are added up called the weighted sum S
- This is then applied to the hard limit function. Let the result be P

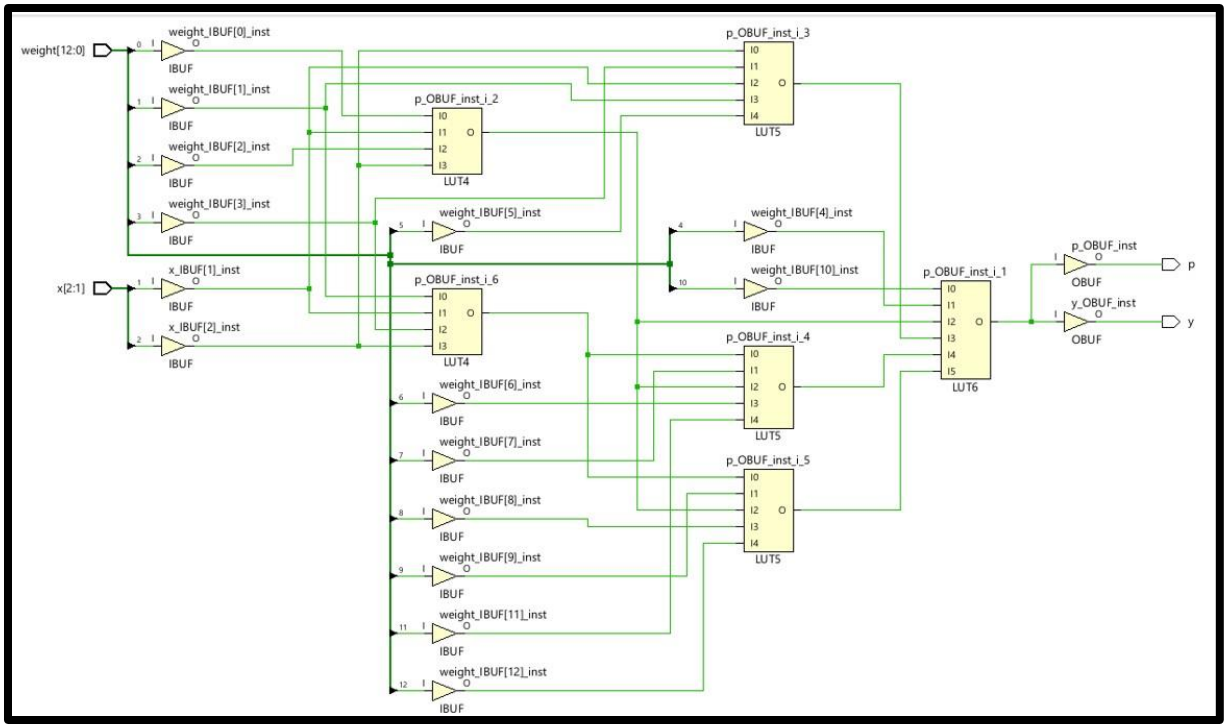
Weighted sum	P
S>0	1
S=0	0

Waveform:

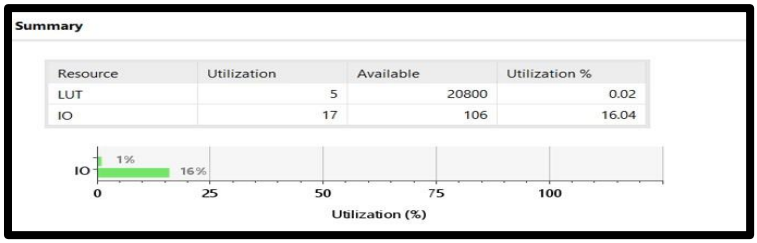
RTL SCHEMATIC:



SYNTHESIS DESIGN:



UTILIZTION SUMMARY:



Summary

Resource	Utilization	Available	Utilization %
LUT	5	20800	0.02
IO	17	106	16.04