

RISC – V PROJECT REPORT (UE20EC302)

SIMULATION OF A BILAYER FEED FORWARD PERCEPTRON USING SYSTEM VERILOG

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Topic: simulation of a simple perceptron model

Abstract:

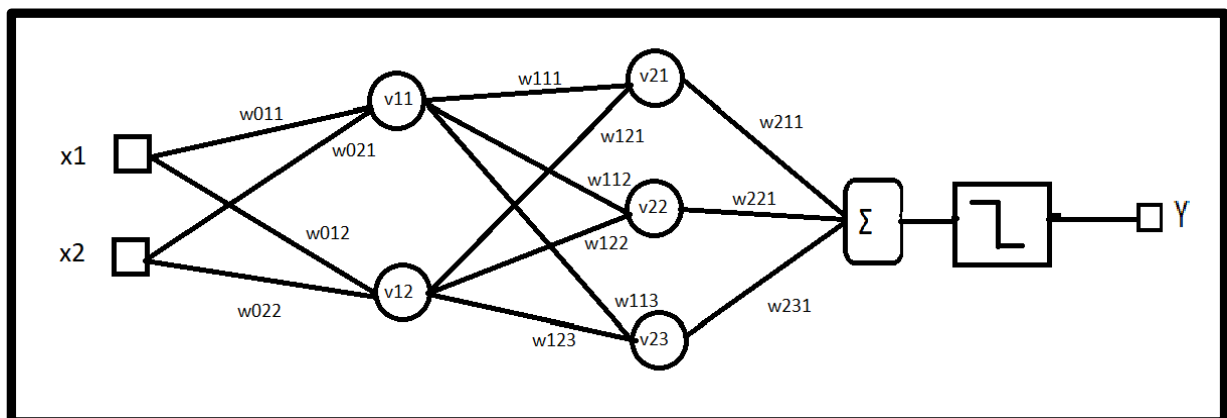
Perceptron is a linear classifier (binary). It helps to classify the given input data.

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*.

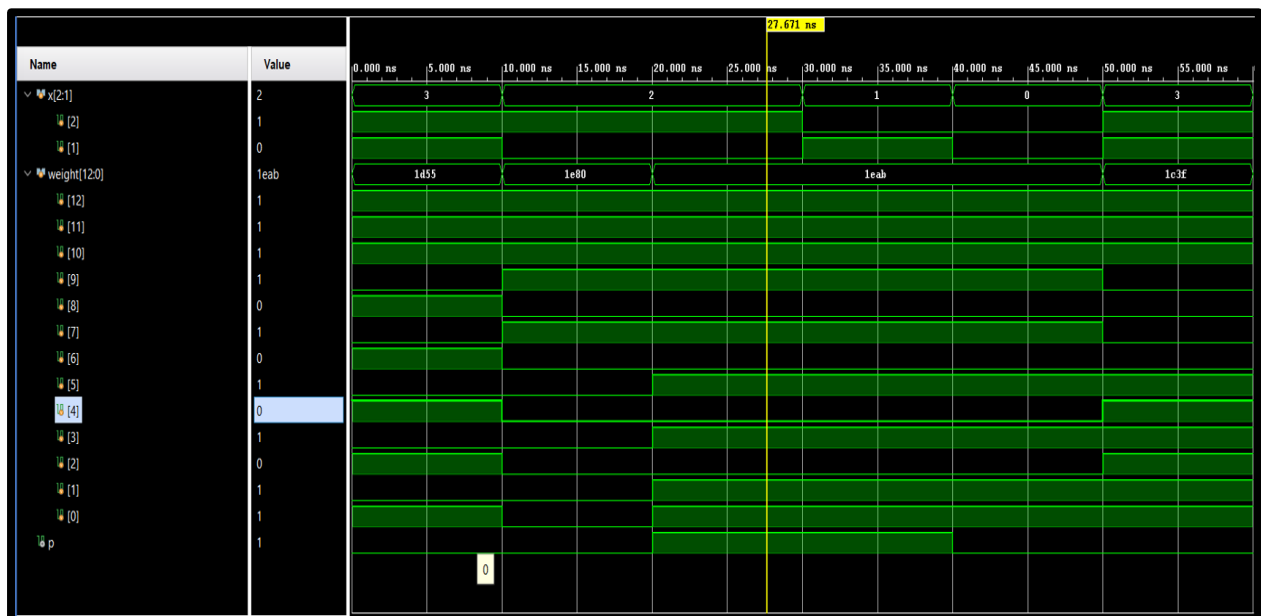


IMPLEMENTATION:

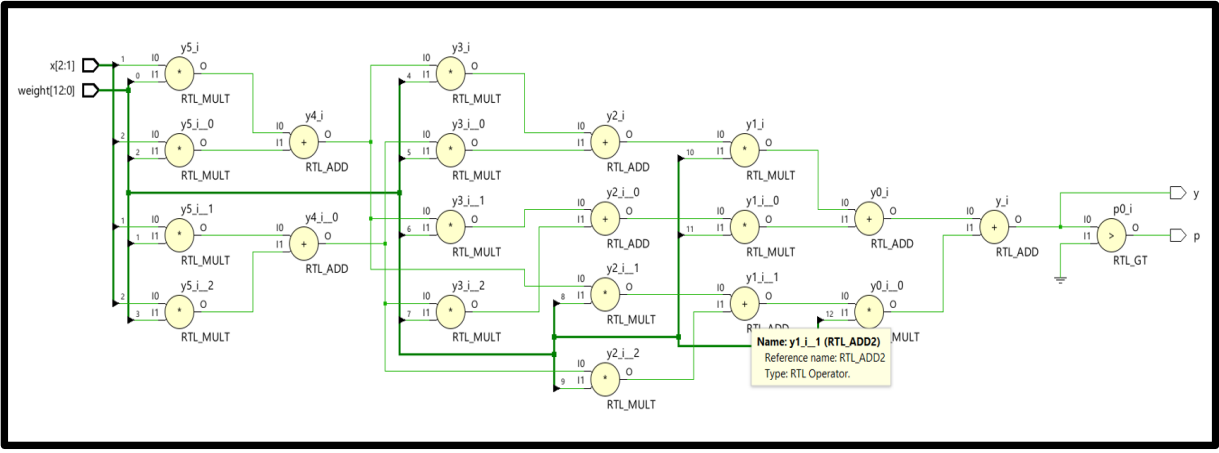
- The simulation was implemented using Verilog.
- The model of perceptron we considered has 2 layers in its hidden layer.
- The user inputs 2 binary values x_1 , x_2 and sets the binary weights of the hidden layer of the perceptron.
- All the multiplied values are added up called the weighted sum S
- This is then applied to the hard limit function. Let the result be P

Weighted sum	P
$S > 0$	1
$S = 0$	0

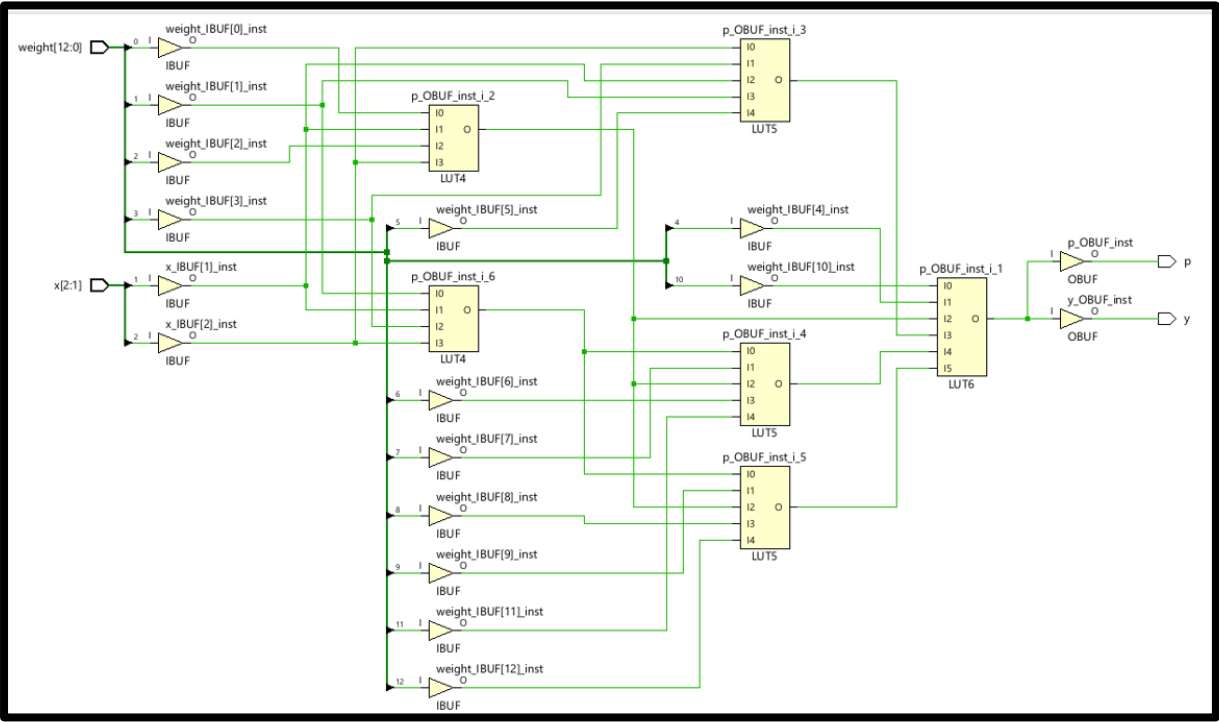
Waveform:



RTL SCHEMATIC:



SYNTHESIS DESIGN:



UTILIZATION SUMMARY:

