Toby Chappell (tchappell@chapman.edu)
Donner Hanson (hanso127@mail.chapman.edu)

Introduction

For this assignment, we simulated AND2 and NOR3 using Vivado.

Expected Truth Table

AND2 Truth Table

A	B	Y = A*B
0	0	0
0	1	0
1	0	0
1	1	1

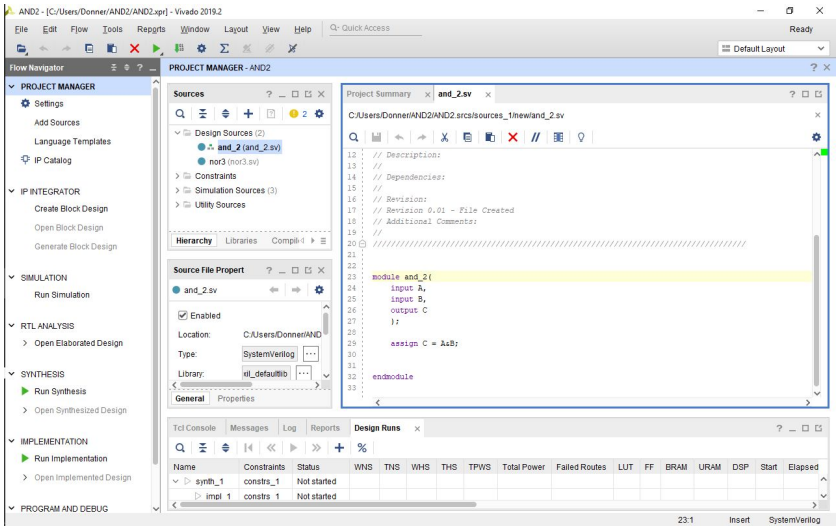
NOR3 Truth Table

A	B	C	Y = (A+B+C)_
0	0	0	1
0	0	1	0
0	1	0	0
0	1	1	0
1	0	0	0
1	0	1	0
1	1	0	0
1	1	1	0

Procedure

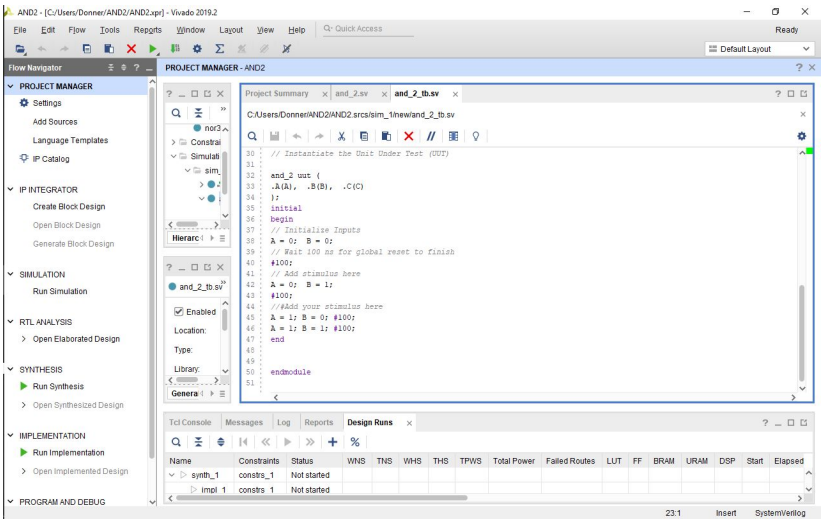
AND2

To simulate NOR3 we specified 3 inputs (A and B) and one output (Y). We then assigned Y to A & B (which is the equivalent to A*B)



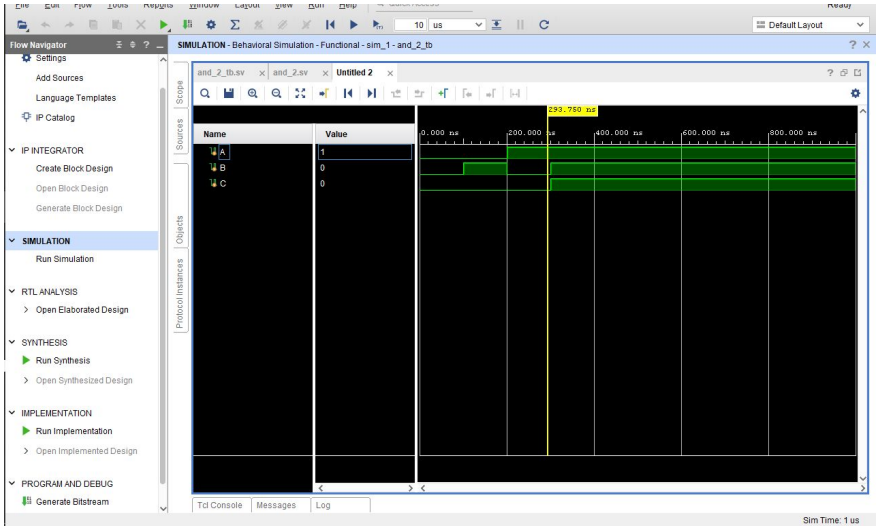
AND2 Test Bench

To simulate AND2, we set the inputs of A and B equal to each possible combination in accordance to the truth table. We also set the duration for 100 clock ticks for each combination.



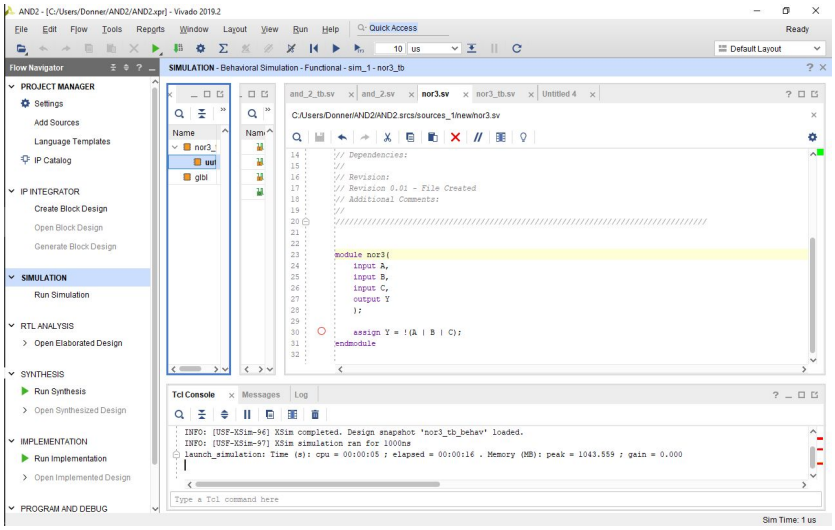
AND2 Waveform

We then simulated our design for AND2 and came up with the following waveform:



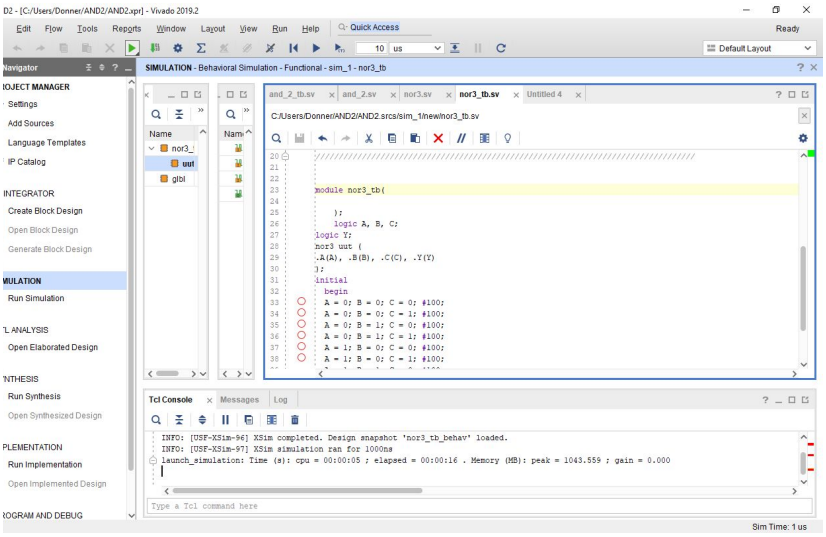
NOR3

To simulate NOR3 we specified 3 inputs (A, B, C) and one output (Y). We then assigned Y to !(A | B | C) (which is the equivalent to (A+B+C)_)



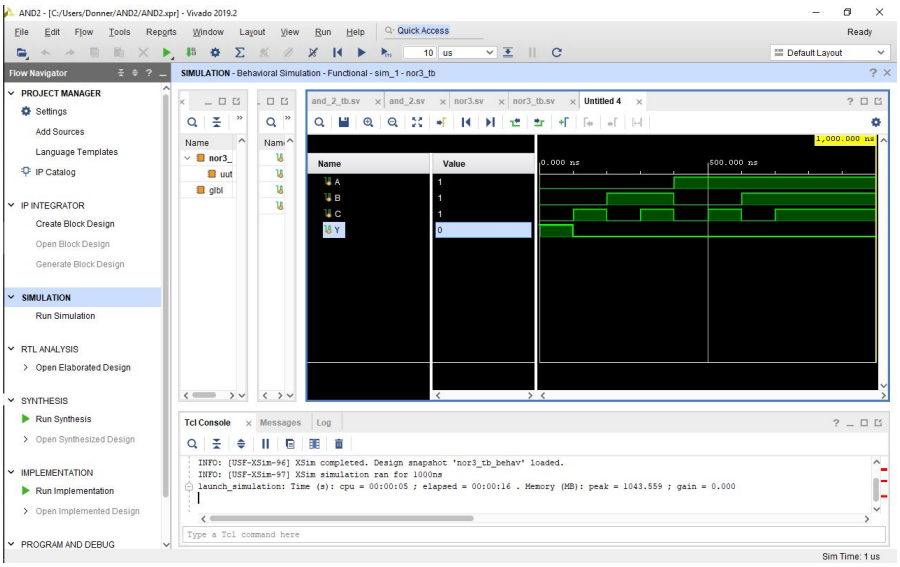
NOR 3 Test Bench

To simulate NOR3, we set the inputs of A, B, and C equal to each possible combination in accordance to the truth table. We also set the duration for 100 clock ticks for each combination.



NOR3 Waveform

We then simulated our design for NOR3 and came up with the following waveform:



Conclusion

Based on our results for AND2, our design works correctly. Y is only high when both A and B are high. Otherwise, Y is low.

Similarly for NOR3, our design functions as specified. Y is only high when all inputs are low. Otherwise, Y is low.