MOJO Part

Conclusion :

After 1-Bit full adder was designed and implanted neatly on a stripboard , we started to verify the functionality of our 1-bit full adder using FPGA. We Used Mojo – V3 FPGA board and Lucid HDL, and created two module that generated input to our 1-bit adder and checked whether the output of our 1-bit adder is correct. One module was tested by manual operation, the other was for automatic operation. These test cases are tested by designing some interfaces like buttons or LEDs to show the testing result.

FPGA tester works manual testing all the possible inputs using FSM

We set output a, b cin and connect the value of a, b, cin to the switches 1,2,3 for manual testing .(switches1 is the first switches on the right; switches2 is the 9th switches from right ;switches3 is the 17th switches from right ), by switching difference switches, different lights will light on according to truth table.

{A, B, C} = {0, 0, 0}, {C,S} = {0, 0}

{A, B, C} = {0, 0, 1}, {C,S} = {0, 1}

{A, B, C} = {0, 1, 0}, {C,S} = {0, 1}

{A, B, C} = {0, 1, 1}, {C,S} = {1, 0}

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FPGA tester works automatically testing all the possible inputs using FSM

We designed 9 states for automatic testing. 8 states are test cases according to truth table, if it passes one test case , a special light will light on. The last state means success if all test cases pass.

Test Cases : ONE

When a=0;b=0,c=0 , if sum=0 and cout=0; the 1st light on;(from right to count)

Test Cases : TWO

When a=0;b=0,c=1 , if sum=0 and cout=0; the 2nd light on;(from right to count)

Test Cases : THR

When a=0;b=1,c=0 , if sum=1 and cout=0; the 3rd light on;(from right to count)

Test Cases : FOU

When a=0;b=1,c=1 , if sum=0 and cout=1; the 4th light on;(from right to count)

Test Cases : FIV

When a=1;b=0,c=0 , if sum=1 and cout=0; the 5th light on;(from right to count)

Test Cases : SIX

When a=1;b=0,c=1 , if sum=0 and cout=1; the 6th light on;(from right to count)

Test Cases : SEV

When a=1;b=1,c=0 , if sum=0 and cout=1; the 7th light on;(from right to count)

Test Cases : EIG

When a=1;b=1,c=1 , if sum=0 and cout=0; the 8th light on;(from right to count)

Test Cases : PASS

When the results of all case are not passes, the 9th to 17th light on;(from right to count)