

Sent ERSO4

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CAN:10093

Homework II

and

HW 2

1-

a.

x	y	z	$x'y'z' + x + y$	$((x + y + z)xy)'$
0	0	0	1	1
0	0	1	0	1
0	1	0	1	1
0	1	1	1	1
1	0	0	1	1
1	0	1	1	1
1	1	0	1	1
1	1	1	1	0

Not equal

b.

x	y	z	$x(x' + y + z)$	$xy + xz$
0	0	0	0	0
0	0	1	0	0
0	1	0	0	0
0	1	1	0	0
1	0	0	0	0
1	0	1	1	1
1	1	0	1	1
1	1	1	1	1

Equal

2-

a. $ABC + A'B + ABC'$

$$AB(C + C') + A'B$$

$$AB + A'B \rightarrow B(A + A') = \underline{\underline{B}}$$

$$b. (x+y)'(x'+y')$$

$$(x'y')(x'+y') = x'y'$$

$$c. xy + x(wz + wz') = xy + xw$$

$$= x(y+w)$$

d. $(a' + c')(a + b' + c') = \cancel{a'a} + \cancel{c'a} + a'b' + \cancel{c'b'} + \cancel{a'c'} + \cancel{c'c'}$

$c'(a + a') + b'(a' + c') + c'$

$c' + b'(a' + c')$

3.)

a. $a_1' a_0' b_1' b_0 \rightarrow m_1$ $c_0 = \sum_m (1, 3, 4, 6, 9, 11, 12, 14)$

$a_1' a_0' b_1 b_0 \rightarrow m_3$

$a_1' a_0 b_1' b_0' \rightarrow m_4$

$a_1' a_0 b_1 b_0' \rightarrow m_6$

$a_1 a_0' b_1' b_0' \rightarrow m_9$

$a_1 a_0' b_1 b_0 \rightarrow m_{11}$

$a_1 a_0 b_1' b_0' \rightarrow m_{12}$

$a_1 a_0 b_1 b_0' \rightarrow m_{14}$

$c_1 = \sum_m (2, 3, 5, 6, 8, 9, 12, 15)$

$c_2 = \sum_m (7, 10, 11, 13, 14, 15)$

b.

$a_1 a_0 b_1 b_0$		$a_1 a_0 b_1 b_0$		$a_1 a_0 b_1 b_0$
✓ 1 0 0 0 1	✓ 1, 3	0 0 - 1	A 4, 9, 3, 11	- 0 - 1
✓ 4 0 1 0 0	✓ 1, 9	- 0 0 1	B 1, 3, 9, 11	- 0 - 1
✓ 3 0 0 1 1	✓ 4, 6	0 1 - 0	C 4, 12, 6, 14	- 1 - 0
✓ 6 0 1 1 0	✓ 4, 12	- 1 0 0	D 4, 6, 12, 14	- 1 - 0
✓ 9 1 0 0 1	✓ 3, 11	- 0 1 1		
✓ 12 1 1 0 0	✓ 6, 14	- 1 1 0		
✓ 11 1 0 1 1	✓ 9, 11	1 0 - 1		
✓ 14 1 1 1 0	✓ 12, 14	1 1 - 0		

$A \rightarrow 1, 9, 3, 11$
 $B \rightarrow 1, 3, 9, 11$
 $C \rightarrow 4, 12, 6, 14$
 $D \rightarrow 6, 6, 12, 14$

$A + C$

$$f(a_1, a_0, b_1, b_0) = a_0' b_0 + a_0 b_0' = 6_0$$

	a_1	a_0	b_1	b_0
✓ 2	0	0	1	0
✓ 8	1	0	0	0
✓ 3	0	0	1	1
5	0	1	0	1
✓ 6	0	1	1	0
✓ 9	1	0	0	1
✓ 12	1	1	0	0
15	1	1	1	1

$\rightarrow 2, 3$
 $\rightarrow 2, 6$
 $\rightarrow 8, 9$
 $\rightarrow 8, 12$

a_1	a_0	b_1	b_0
0	0	1	-
0	-	1	0
1	0	0	-
1	-	0	0

$A \rightarrow 5$
 $B \rightarrow 15$
 $C \rightarrow 2, 3$
 $D \rightarrow 2, 6$
 $E \rightarrow 8, 9$
 $F \rightarrow 8, 12$

$$C_1(a_1, a_0, b_1, b_0) = a_1' a_0 b_1' b_0 + a_1 a_0 b_1 b_0 + a_1' a_0' b_1 + a_1' b_1 b_0' + a_1 a_0' b_1' + a_1 b_1' b_0'$$

	a_1	a_0	b_1	b_0
✓ 10	1	0	1	0
✓ 7	0	1	1	1
✓ 11	1	0	1	1
✓ 13	1	1	0	1
✓ 14	1	1	1	0
✓ 15	1	1	1	1

$\rightarrow 10, 11$
 $\rightarrow 10, 14$
 $\rightarrow 7, 15$
 $\rightarrow 13, 15$

a_1	a_0	b_1	b_0
1	0	1	-
1	-	1	0
-	1	1	1
1	1	-	0

$A \rightarrow 10, 11$
 $B \rightarrow 10, 14$
 $C \rightarrow 7, 15$
 $D \rightarrow 13, 15$

$$C_2(a_1, a_0, b_1, b_0) = a_1 a_0' b_1 + a_1 b_1 b_0' + a_0 b_1 b_0 + a_1 b_0 b_0'$$

ISE Project Navigator (P.20131013) - /home/ise/Documents/LogHW1/LogHW1.xise - [Case_Statement (RTL1)]

File Edit View Project Source Process Tools Window Layout Help

Design

View: ☒ Implementation ☐ Simulation

Hierarchy

- LogHW1
 - xc3s400-4pq208
 - Case_Statement - Behavioral (Boole

No Processes Running

Processes: Case_Statement - Behavioral

- Design Summary/Reports
- Design Utilities
- User Constraints
- Synthesize - XST
- View RTL Schematic
- View Technology Schematic
- Check Syntax
- Generate Post-Synthesis Simul...
- Implement Design
- Translate

Start Design Files Libraries

Design Summary (Synthesized) Boolean_Function_Case_Statement.vhd Case_Statement.ngr:1 Case_Statement (RTL1)

View by Category

Design Objects of Top Level Block

Instances Pins Signals Name Value

Case_Statement

Properties: (No Selection)

Console Errors Warnings Find in Files Results View by Category

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ISim (P.20131013) - [Default.wcfg]

File Edit View Simulation Window Layout Help

Instances and Processes

Instance and Process Name	Design Unit	Block Type
boolean_function_case...	boolean_fu...	VHDL Entity
std_logic_1164	std_logic_1...	VHDL Package

Name Value

a1 0

a0 0

b1 0

b0 0

c0 0

c1 0

c2 0

0 ns 50 ns 100 ns 150 ns 200 ns 250 ns 300 ns 350 ns 400 ns 450 ns 500 ns

8.500 ns

X1: 8.500 ns

Default.wcfg

Console

This is a Full version of ISim.
Time resolution is 1 ps
Simulator is doing circuit initialization process.
Finished circuit initialization process.
ISim>

Console Compilation Log Breakpoints Find in Files Results Search Results

[ShareThese - File Bro... ShareThese - File Brow... Terminal ISE Project Navigator (ISim (P.20131013) - [D...

Sim Time: 1,000,000 ps