Lab 3 Report

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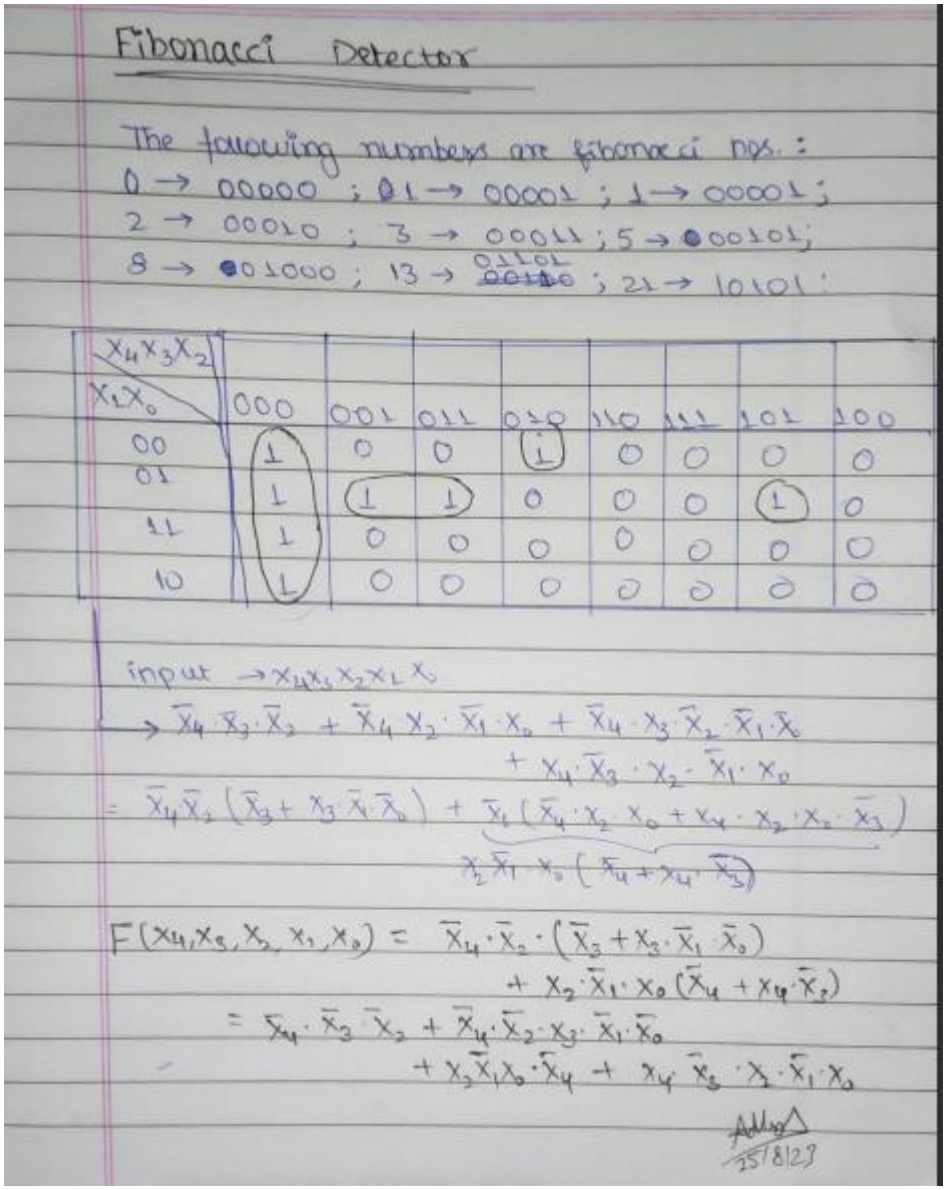
WEL – 2 || FR - 2 / T – 2

Fibonacci Detector

Lab Notebook:



Fibonacci Detector

The following numbers are fibonacci nos. :

0 → 00000 ; 01 → 00001 ; 1 → 00001 ;

2 → 00010 ; 3 → 00011 ; 5 → 00101 ;

8 → 01000 ; 13 → 01101 ; 21 → 10101 ;

$X_4X_3X_2$ / X_1X_0	000	001	011	010	110	111	101	100
00	1	0	0	1	0	0	0	0
01	1	1	1	0	0	0	1	0
11	1	0	0	0	0	0	0	0
10	1	0	0	0	0	0	0	0

input → $x_4x_3x_2x_1x_0$

→ $\bar{x}_4\cdot\bar{x}_3\cdot\bar{x}_2 + \bar{x}_4 x_3\cdot\bar{x}_1\cdot x_0 + \bar{x}_4\cdot x_3\cdot\bar{x}_2\cdot\bar{x}_1\cdot\bar{x}_0 + x_4\cdot\bar{x}_3\cdot x_2\cdot\bar{x}_1\cdot x_0$

$= \bar{x}_4\bar{x}_2(\bar{x}_3 + x_3\cdot\bar{x}_1\cdot\bar{x}_0) + \bar{x}_1(\bar{x}_4\cdot x_2\cdot x_0 + x_4\cdot x_2\cdot\bar{x}_3)$

~~$x_2\bar{x}_1 x_0(\bar{x}_4 + x_4\cdot\bar{x}_3)$~~

$F(x_4,x_3,x_2,x_1,x_0) = \bar{x}_4\cdot\bar{x}_2\cdot(\bar{x}_3 + x_3\cdot\bar{x}_1\cdot\bar{x}_0) + x_2\cdot\bar{x}_1\cdot x_0(\bar{x}_4 + x_4\cdot\bar{x}_3)$

$= \bar{x}_4\cdot\bar{x}_3\cdot\bar{x}_2 + \bar{x}_4\cdot\bar{x}_2\cdot x_3\cdot\bar{x}_1\cdot\bar{x}_0 + x_3\bar{x}_1x_0\cdot\bar{x}_4 + x_4\cdot\bar{x}_3\cdot x_2\cdot\bar{x}_1\cdot x_0$

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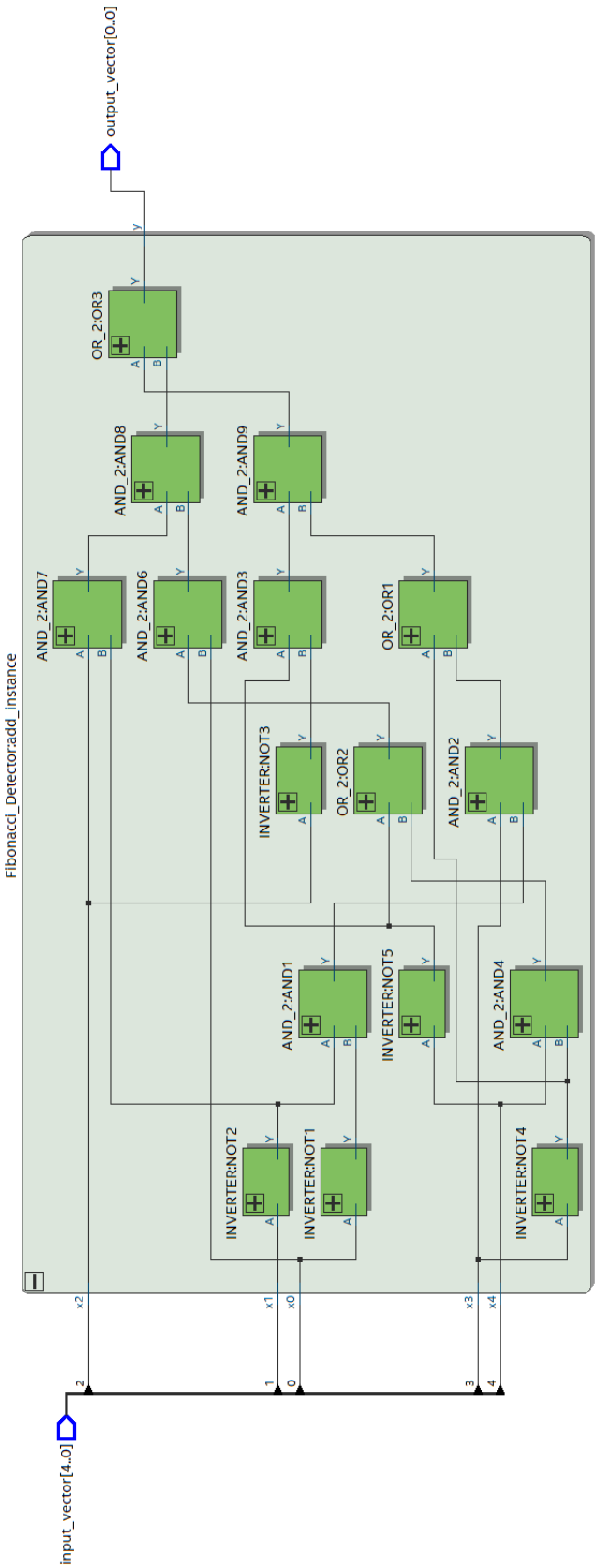
RTL Viewer:


output_vector[0..0]
Fibonacci_Detector:add_instance
OR_2:OR3
AND_2:AND8
AND_2:AND9
AND_2:AND7
AND_2:AND6
AND_2:AND3
OR_2:OR1
INVERTER:NOT3
OR_2:OR2
AND_2:AND2
AND_2:AND1
INVERTER:NOT5
AND_2:AND4
INVERTER:NOT2
INVERTER:NOT1
INVERTER:NOT4
input_vector[4..0]

RTL Simulation: