

HO CHI MINH CITY NATIONAL UNIVERSITY  
HO CHI MINH CITY UNIVERSITY OF TECHNOLOGY  
FACULTY OF COMPUTER SCIENCE AND ENGINEERING



# REPORT

## LAB 4: Review processing to practice

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## 1. Modifying Netlist to make a “bug” intentionally

```
CLKAND2X12 g7277__8428(.A (n_25), .B (n_2), .Y (n_92));
INVX2 g7299(.A (n_8), .Y (n_26));
INVX2 g7300(.A (n_8), .Y (n_57));
NAND2X2 g7274__5526(.A (F_present_state[2]), .B (F_present_state[0]),
.Y (n_29));
OR2X4 g7261__6783(.A (F_present_state[3]), .B (F_present_state[1]),
.Y (n_184));
NOR2X4 g7254__3680(.A (a_present_state[3]), .B (a_present_state[1]),
.Y (n_9));
NOR2X4 g7276__1617(.A (F_present_state[2]), .B (F_present_state[0]),
.Y (n_100));
CLKINVX16 g7293(.A (n_1), .Y (n_11));
NAND2X4 g7280__2802(.A (F_present_state[3]), .B (F_present_state[1]),
.Y (n_195));
CLKINVX8 g7303(.A (a_present_state[0]), .Y (n_2));
CLKINVX12 g7296(.A (a_present_state[2]), .Y (n_1));
CLKINVX8 g7301(.A (a_present_state[4]), .Y (n_8));
INVX1 g7281(.A (flick), .Y (n_0));
INVX2 g7282(.A (F_present_state[2]), .Y (n_3));
CLKINVX6 g7298(.A (a_present_state[1]), .Y (n_25));
CLKINVX8 g7283(.A (a_present_state[3]), .Y (n_28));
INVX3 g7304(.A (F_present_state[1]), .Y (n_173));
-- INSERT --
```

```
CLKAND2X12 g7277__8428(.A (n_25), .B (n_2), .Y (n_92));
INVX2 g7299(.A (n_8), .Y (n_26));
//INVX2 g7300(.A (n_8), .Y (n_57));
BUFX2 g7300(.A (n_8), .Y (n_57));
NAND2X2 g7274__5526(.A (F_present_state[2]), .B (F_present_state[0]),
.Y (n_29));
OR2X4 g7261__6783(.A (F_present_state[3]), .B (F_present_state[1]),
.Y (n_184));
NOR2X4 g7254__3680(.A (a_present_state[3]), .B (a_present_state[1]),
.Y (n_9));
NOR2X4 g7276__1617(.A (F_present_state[2]), .B (F_present_state[0]),
.Y (n_100));
CLKINVX16 g7293(.A (n_1), .Y (n_11));
NAND2X4 g7280__2802(.A (F_present_state[3]), .B (F_present_state[1]),
.Y (n_195));
CLKINVX8 g7303(.A (a_present_state[0]), .Y (n_2));
CLKINVX12 g7296(.A (a_present_state[2]), .Y (n_1));
CLKINVX8 g7301(.A (a_present_state[4]), .Y (n_8));
INVX1 g7281(.A (flick), .Y (n_0));
INVX2 g7282(.A (F_present_state[2]), .Y (n_3));
CLKINVX6 g7298(.A (a_present_state[1]), .Y (n_25));
CLKINVX8 g7283(.A (a_present_state[3]), .Y (n_28));
-- INSERT --
```

Changing the inverter INVX2 g7300 into BUFX2 g7300.

## 2. Debug non-equivalent point

```
0
// Command: add_compared_points -all
// 26 compared points added to compare list
0
// Command: compare
```

Compared points	PO	DFF	Total
Equivalent	11	5	16
<u>Non-equivalent</u>	6	4	10

```
0
```

Compare done!

Non-equivalent point detected!

## 3. Mapping manager

The screenshot shows the Mapping Manager window with the following sections:

- Unmapped Points:** Empty list.
- Mapped Points:** Two columns showing mapped points. The left column lists points like PI 1 clk, PI 2 rst\_n, PI 3 flick, PO 4 lamp[16], PO 5 lamp[15], PO 6 lamp[14], and PO 7 lamp[13]. The right column lists points like PI 1 clk, PI 2 rst\_n, PI 3 flick, PO 4 lamp[16], PO 5 lamp[15], PO 6 lamp[14], and PO 7 lamp[13].
- Compared Points:** Two columns showing compared points. The left column lists points like PO 10 lamp[10], PO 13 lamp[7], PO 14 lamp[6], PO 15 lamp[5], PO 16 lamp[4], PO 20 lamp[0], DFF 26 F\_present\_state\_reg[3], DFF 27 F\_present\_state\_reg[2], DFF 28 F\_present\_state\_reg[1], and DFF 29 F\_present\_state\_reg[0]. The right column lists points like PO 10 lamp[10], PO 13 lamp[7], PO 14 lamp[6], PO 15 lamp[5], PO 16 lamp[4], PO 20 lamp[0], DFF 22 F\_present\_state\_reg[3]U\$1, DFF 24 F\_present\_state\_reg[2]U\$1, DFF 23 F\_present\_state\_reg[1]U\$1, and DFF 29 F\_present\_state\_reg[0]U\$1.

A blue bracket highlights the non-equivalent points in the Compared Points section, with the text "All non-equivalent points" next to it.

The bottom section shows the Mapping Manager window with the following sections:

- Unmapped Points:** Empty list.
- Mapped Points:** Two columns showing mapped points. The left column lists points like PI 1 clk, PI 2 rst\_n, PI 3 flick, PO 4 lamp[16], PO 5 lamp[15], PO 6 lamp[14], and PO 7 lamp[13]. The right column lists points like PI 1 clk, PI 2 rst\_n, PI 3 flick, PO 4 lamp[16], PO 5 lamp[15], PO 6 lamp[14], and PO 7 lamp[13].
- Compared Points:** Two columns showing compared points. The left column lists points like PO 10 lamp[10], PO 13 lamp[7], PO 14 lamp[6], PO 15 lamp[5], PO 16 lamp[4], PO 20 lamp[0], DFF 26 F\_present\_state\_reg[3], DFF 27 F\_present\_state\_reg[2], DFF 28 F\_present\_state\_reg[1], and DFF 29 F\_present\_state\_reg[0]. The right column lists points like PO 10 lamp[10], PO 13 lamp[7], PO 14 lamp[6], PO 15 lamp[5], PO 16 lamp[4], PO 20 lamp[0], DFF 22 F\_present\_state\_reg[3]U\$1, DFF 24 F\_present\_state\_reg[2]U\$1, DFF 23 F\_present\_state\_reg[1]U\$1, and DFF 29 F\_present\_state\_reg[0]U\$1.

A context menu is open over the compared points, showing options like "Delete Compared Point", "Diagnose", "Change Mapping Phase", "Report Gate", "Bus Grouping", "Sequential Merge", and "Source Code".

## 4. Diagnosis manager

Diagnosis Manager

Close Schematics Refresh Preferences Window Help

Golden Revised

Compared Point  
PO 10 lamp[10]

Diagnosis Point (active)  
(0) PO 10 lamp[10] (1) PO 10 lamp[10]

Diagnosis Points (inputs)

Corresponding Support

(1) DFF 21 a_present_state_reg[4]	(1) DFF 28 a_present_state_reg[4]/U\$1
(1) DFF 22 a_present_state_reg[3]	(1) DFF 25 a_present_state_reg[3]/U\$1
(0) DFF 23 a_present_state_reg[2]	(0) DFF 21 a_present_state_reg[2]/U\$1
(1) DFF 24 a_present_state_reg[1]	(1) DFF 26 a_present_state_reg[1]/U\$1
(1) DFF 25 a_present_state_reg[0]	(1) DFF 27 a_present_state_reg[0]/U\$1

Non-corresponding Support

Error Pattern All 0s All 1s

1: 1 1 0 1 1 0 1	0 1
2: 1 1 1 0 0 0 1	0 1
3: 1 1 1 1 0 0 1	0 1
4: 1 1 1 1 1 0 1	0 1
5: 0 1 1 0 1 1 0	1 0
6: 0 1 0 1 1 1 0	1 0
7: 0 1 1 1 0 1 0	1 0
8: 1 1 1 0 1 0 1	0 1
9: 1 1 1 0 1 0 1	0 1

Error Candidate

(1.00) BUF 161	g7300/U\$1
(0.50) INV 67	g7263/U\$1
(0.50) NOR 163	g7239_6131/U\$1
(0.40) INV 59	g7293/U\$1

## 5. Schematic viewer

Flattened Schematics: Gate:10 (Revised/Diagnosed)

File View Trace Preferences Window

Object:

Design Find Options

Revised

bound\_flasher,

Selected:

Flattened Schematics: Gate:10 (Golden/Diagnosed)

File View Trace Preferences Window

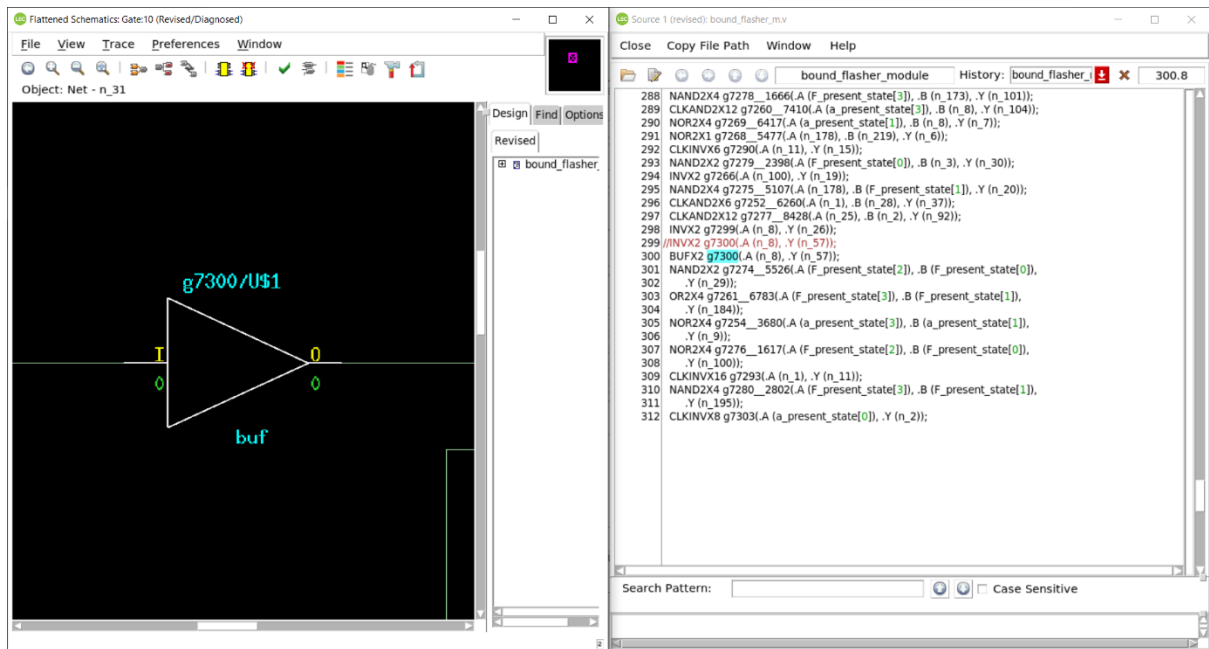
Object:

Design Find Options

Golden

bound\_flasher,

Selected:



The Schematic shows us the point that we previously modified.