

2023 超大型積體電路電腦輔助設計概論

2023 Introduction to VLSI CAD

Lab 11

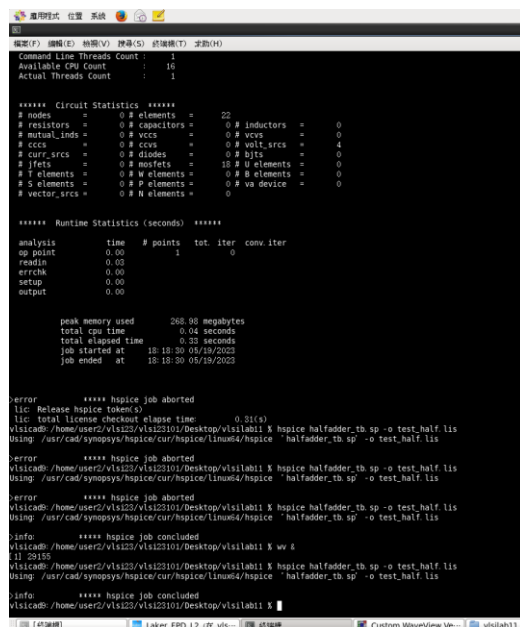
學號：E94096110

姓名：鄭智宇

※作業要求的圖請使用**電腦截圖程式**截取，請勿用手機拍照的方式繳交

※Report 檔請以 pdf 的格式繳交

- HA
 - Presim
 - 請截取 terminal 顯示 job concluded 的圖



```
Command Line Threads Count: 1
Available CPU Count: 10
Actual Threads Count: 1

***** Circuit Statistics *****
# nodes = 0 # elements = 22
# resistors = 0 # capacitors = 0 # inductors = 0
# mutual_ind = 0 # vcvs = 0 # vcs = 0
# ccvs = 0 # ccvs = 0 # volt_srcs = 4
# curr_srcs = 0 # diodes = 0 # dijs = 0
# jfets = 0 # mosfets = 18 # u_elements = 0
# f_elements = 0 # w_elements = 0 # b_elements = 0
# s_elements = 0 # p_elements = 0 # va_device = 0
# vector_srcs = 0 # n_elements = 0

***** Runtime Statistics (seconds) *****
analysis time # points tot iter conv iter
sp point 0.00 1 0
readin 0.00
errchk 0.00
setup 0.00
output 0.00

peak memory used 268.98 megabytes
total cpu time 0.04 seconds
total elapsed time 0.33 seconds
job started at 18:30:01/19/2023
job ended at 18:30:05/19/2023

error ***** hspice job aborted
lic: Release hspice token(s)
lic: total license checkout elapse time 0.31(s)
vlicad@ /home/user/v16122/v1612201/Desktop/v161lab1: hspice halfadder.tb.sp -o test_half.lis
Using /usr/cad/synopsys/hspice/cur/hspice/linux64/hspice_halfadder.tb.sp -o test_half.lis

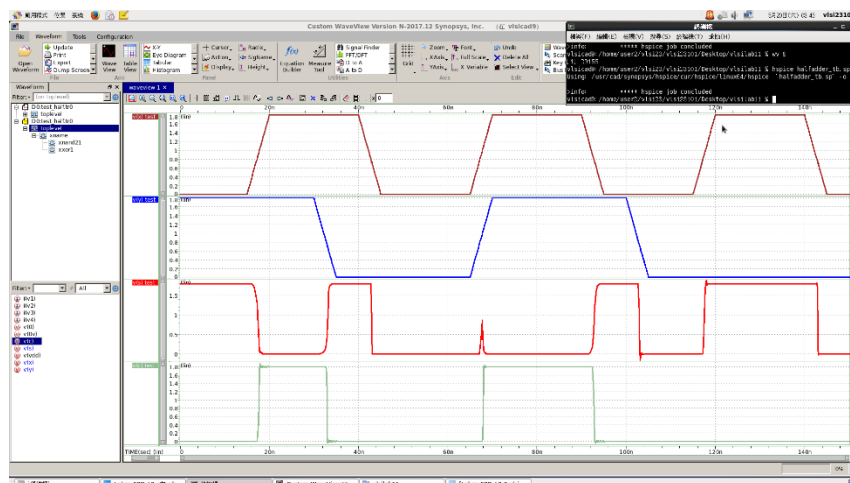
error ***** hspice job aborted
vlicad@ /home/user/v16122/v1612201/Desktop/v161lab1: hspice halfadder.tb.sp -o test_half.lis
Using /usr/cad/synopsys/hspice/cur/hspice/linux64/hspice_halfadder.tb.sp -o test_half.lis

error ***** hspice job aborted
vlicad@ /home/user/v16122/v1612201/Desktop/v161lab1: hspice halfadder.tb.sp -o test_half.lis
Using /usr/cad/synopsys/hspice/cur/hspice/linux64/hspice_halfadder.tb.sp -o test_half.lis

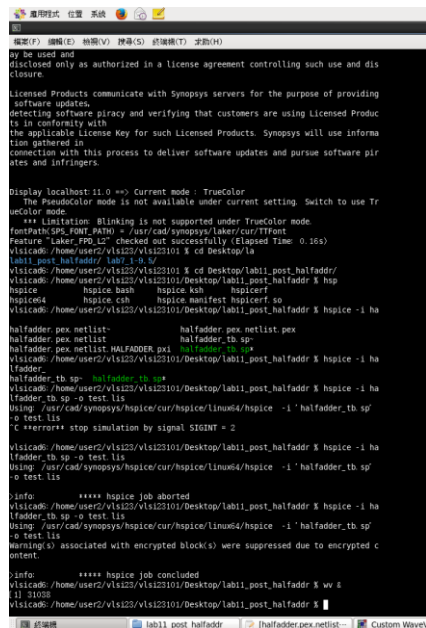
info ***** hspice job concluded
vlicad@ /home/user/v16122/v1612201/Desktop/v161lab1: hspice halfadder.tb.sp -o test_half.lis
Using /usr/cad/synopsys/hspice/cur/hspice/linux64/hspice_halfadder.tb.sp -o test_half.lis

info ***** hspice job concluded
vlicad@ /home/user/v16122/v1612201/Desktop/v161lab1: hspice halfadder.tb.sp -o test_half.lis
Using /usr/cad/synopsys/hspice/cur/hspice/linux64/hspice_halfadder.tb.sp -o test_half.lis
```

- 請截取 WaveView 中的波形



- Post-sim
- 請截取 terminal 顯示 job concluded 的圖



```

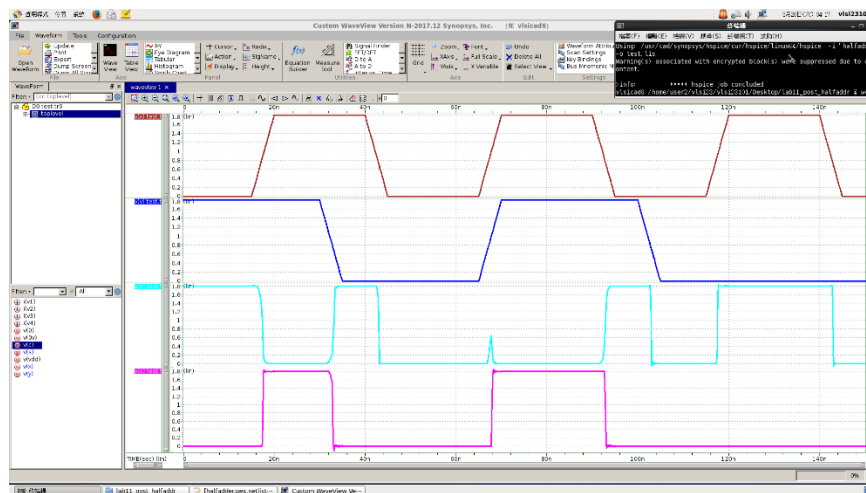
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software updates,
detecting software piracy and verifying that customers are using Licensed Produc
ts in conformity with
the applicable License Key for such Licensed Products. Synopsys will use informa
tion gathered in
connection with this process to deliver software updates and pursue software pir
ates and infringers.

Display localhost:11.0 ==> Current mode : TrueColor
The PseudoColor mode is not available under current setting. Switch to use Tr
ueColor mode.
*** Limitation: Blinking is not supported under TrueColor mode.
fontPath:PS_FONT_PATH = /usr/cad/synopsys/laker/cur/Font
Feature "Laker_FPD_L2" checked out successfully (Elapsed Time: 0.16s)
vlsiCad6 /home/user/vlsi22/vlsi22101 % cd Desktop/lab1_post_halfaddr/la
b1_post_halfaddr/ lab1 % ls
vlsiCad6 /home/user/vlsi22/vlsi22101/Desktop/lab1_post_halfaddr/
vlsiCad6 /home/user/vlsi22/vlsi22101/Desktop/lab1_post_halfaddr % hsp
hspice
hspice bash hspice ksh hspice rf
hspice4 hspice csh hspice manifest hspicert sp
vlsiCad6 /home/user/vlsi22/vlsi22101/Desktop/lab1_post_halfaddr % hspice -i ha
lfadder.pex netlist- halfadder.pex netlist pex
halfadder.pex netlist halfadder.tb sp-
halfadder.pex netlist HALFADDER.pxl halfadder.tb sp-
vlsiCad6 /home/user/vlsi22/vlsi22101/Desktop/lab1_post_halfaddr % hspice -i ha
lfadder.tb sp- halfadder.tb sp-
vlsiCad6 /home/user/vlsi22/vlsi22101/Desktop/lab1_post_halfaddr % hspice -i ha
lfadder.tb sp -o test lis
Using /usr/cad/synopsys/hspice/cur/hspice/linus64/hspice -i "halfadder.tb sp"
-o test lis
C **error** stop simulation by signal SIGINT = 2
vlsiCad6 /home/user/vlsi22/vlsi22101/Desktop/lab1_post_halfaddr % hspice -i ha
lfadder.tb sp -o test lis
Using /usr/cad/synopsys/hspice/cur/hspice/linus64/hspice -i "halfadder.tb sp"
-o test lis
**** hspice job aborted
vlsiCad6 /home/user/vlsi22/vlsi22101/Desktop/lab1_post_halfaddr % hspice -i ha
lfadder.tb sp -o test lis
Using /usr/cad/synopsys/hspice/cur/hspice/linus64/hspice -i "halfadder.tb sp"
-o test lis
Warning(s) associated with encrypted block(s) were suppressed due to encrypted c
ontent.
vlsiCad6 /home/user/vlsi22/vlsi22101/Desktop/lab1_post_halfaddr % hspice -i ha
lfadder.tb sp -o test lis
**** hspice job concluded
vlsiCad6 /home/user/vlsi22/vlsi22101/Desktop/lab1_post_halfaddr % w
%j 31038
vlsiCad6 /home/user/vlsi22/vlsi22101/Desktop/lab1_post_halfaddr %

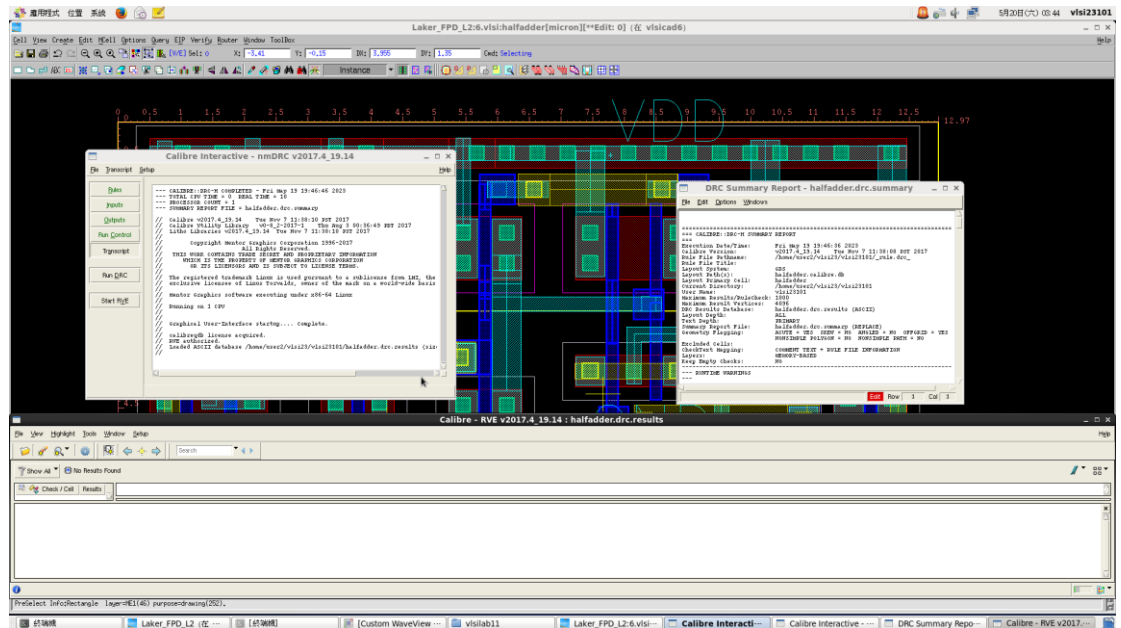
```

- 請截取 WaveView 中的波形

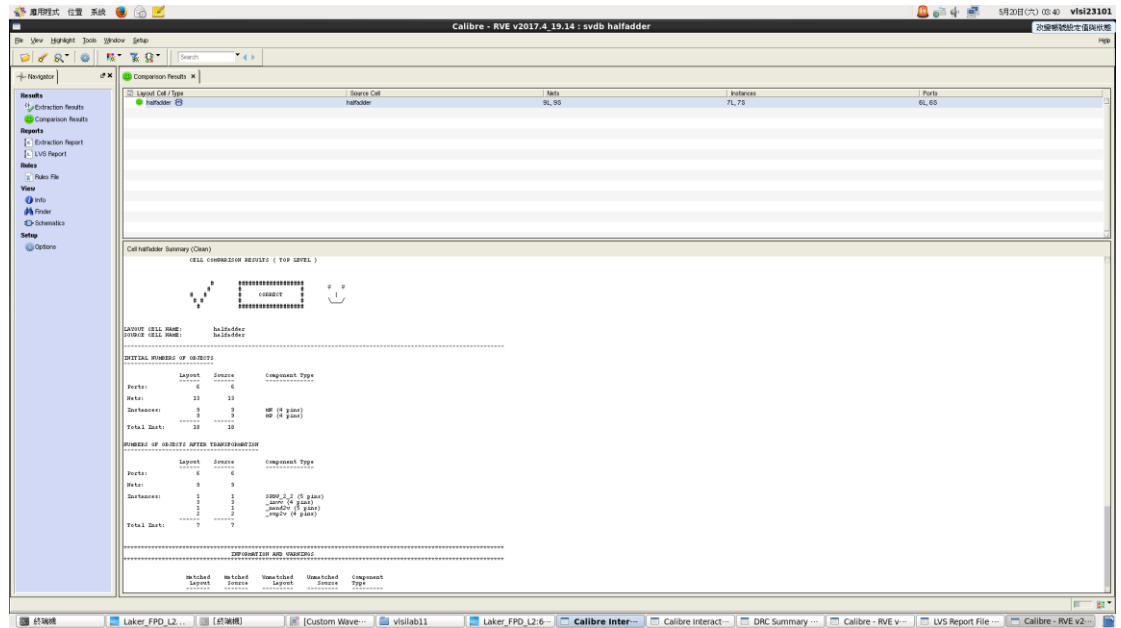


- DRC/LVS 結果

DRC

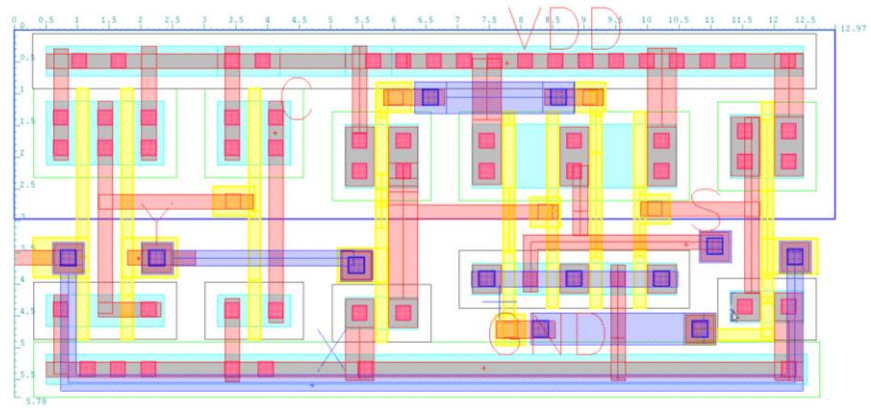


LVS



- Layout 截圖(顯示長寬)

$$5.78 * 12.97 = 74.9666$$



- 嘗試簡單說明 Presim 與 Post-sim 結果比較

整體看起來差不多，在波型變化處 post 比 pre 比較緩一點

- DFF
 - Presim
 - 請截取 terminal 顯示 job concluded 的圖

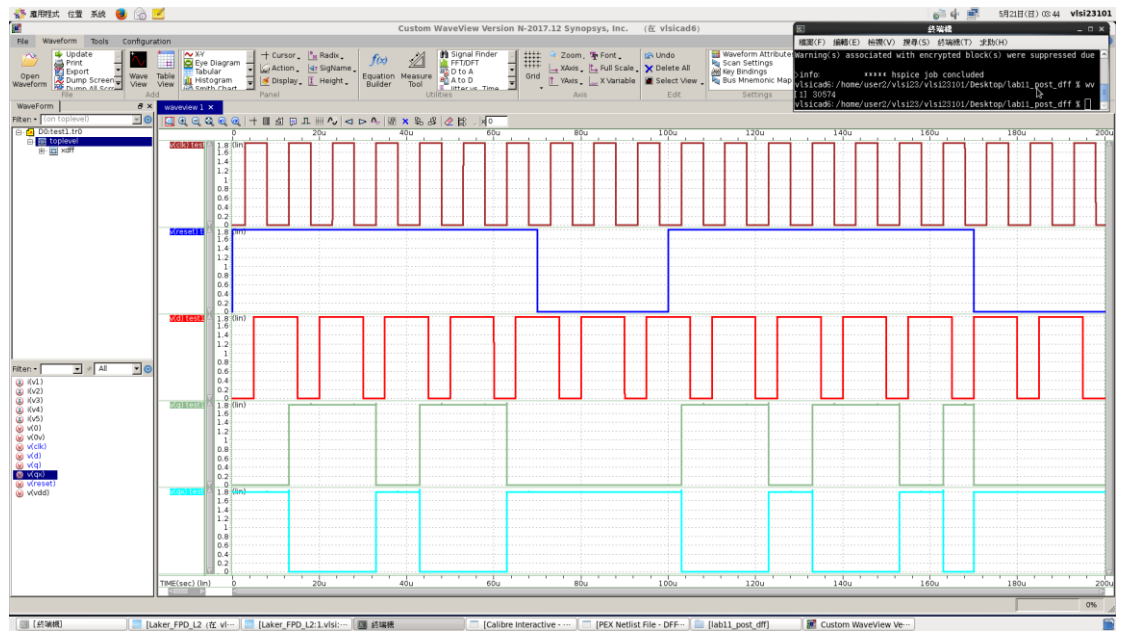
```

=====
-> Available Cell Based Design Kit <=====
=====
| vlsicad6 | vlsicad7 | vlsicad8 | vlsicad9 |
|-----|
| CBOK Path |
|-----|
|
| ARM
|-----|
| Y | V | W |
|-----|
| IC Contest / 2.1 | /usr/cad/CBOK/IC Contest_v2.1 |
|-----|
=====
#
# Available Workstations: vlsicad6, vlsicad7, vlsicad8 & vlsicad9
# When you exceed disk quotas below, you can't modify or create files!
# When you leave, LOGOUT and SHUTDOWN the computer please!
# If there is any problem, contact Room #516 please. Thanks!
# All files in trash can will be empty in next login.
#
=====
Disk quotas for user vls123101 (uid 1833):
Filesystem      space quota limit grace files quota limit grace
-----
192 192 100 10 /array
192M 1024M 1536M 3308 10000 15000
vlsicad6:/home/user2/vls123/vls123101/Desktop % cd Desktop/
vlsicad6:/home/user2/vls123/vls123101/Desktop % cd vlsi
vlsicad6:/home/user2/vls123/vls123101/Desktop % cd vlsi
vlsicad6:/home/user2/vls123/vls123101/Desktop % cd vlsilab1/
vlsicad6:/home/user2/vls123/vls123101/Desktop % cd vlsilab1/
vlsicad6:/home/user2/vls123/vls123101/Desktop % hsp
hspice hspice bash hspice kah hspicerrf
hspice64 hspice.csh hspice.manifest hspicerrf so
vlsicad6:/home/user2/vls123/vls123101/Desktop/vlsilab1 % hspi
hspice hspice bash hspice kah hspicerrf
hspice64 hspice.csh hspice.manifest hspicerrf so
vlsicad6:/home/user2/vls123/vls123101/Desktop/vlsilab1 % hspice DFF
DFF.sp: ***
vlsicad6:/home/user2/vls123/vls123101/Desktop/vlsilab1 % hspice New_DFF.tb.sp -
o test1.lis
Using /usr/cad/synopsys/hspice/cur/hspice/linux64/hspice "New_DFF.tb.sp" -o te
st1.lis
**** hspice job concluded
vlsicad6:/home/user2/vls123/vls123101/Desktop/vlsilab1 % wv &
%1 21370
vlsicad6:/home/user2/vls123/vls123101/Desktop/vlsilab1 %
%1 Done
vlsicad6:/home/user2/vls123/vls123101/Desktop/vlsilab1 % hspice New_DFF.tb.sp -o test1.lis
Using /usr/cad/synopsys/hspice/cur/hspice/linux64/hspice "New_DFF.tb.sp" -o test1.lis
**** hspice job concluded
vlsicad6:/home/user2/vls123/vls123101/Desktop/vlsilab1 %

```

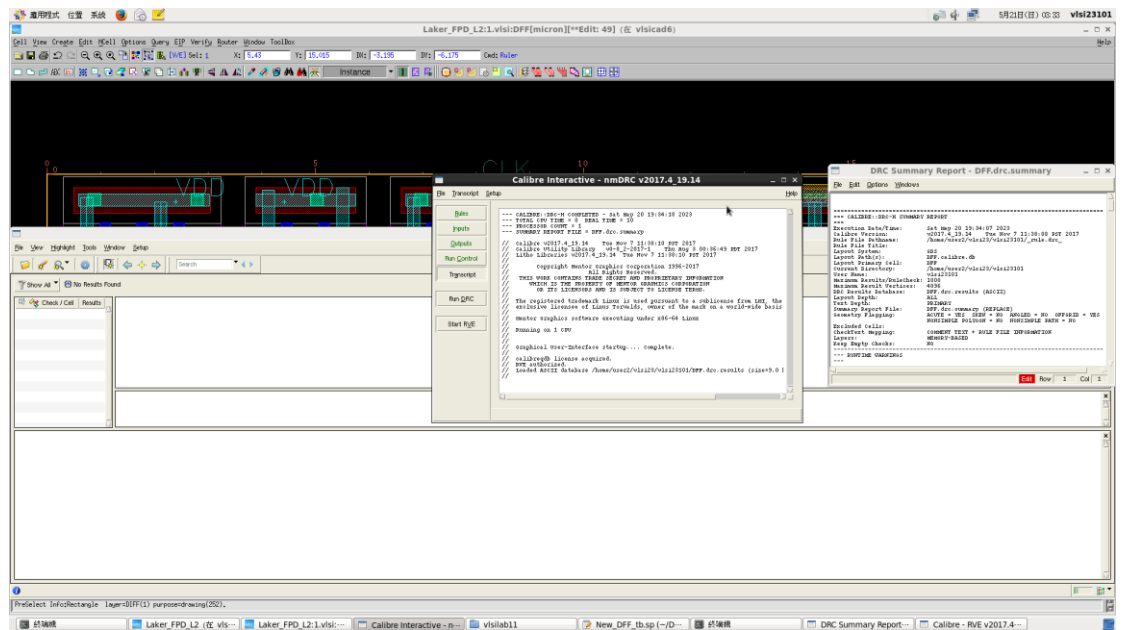
- 請截取 WaveView 中的波形





- DRC/LVS 結果

DRC



LVS

