

# 2024 超大型積體電路電腦輔助設計概論

## 2024 Introduction to VLSI CAD

### Lab 10

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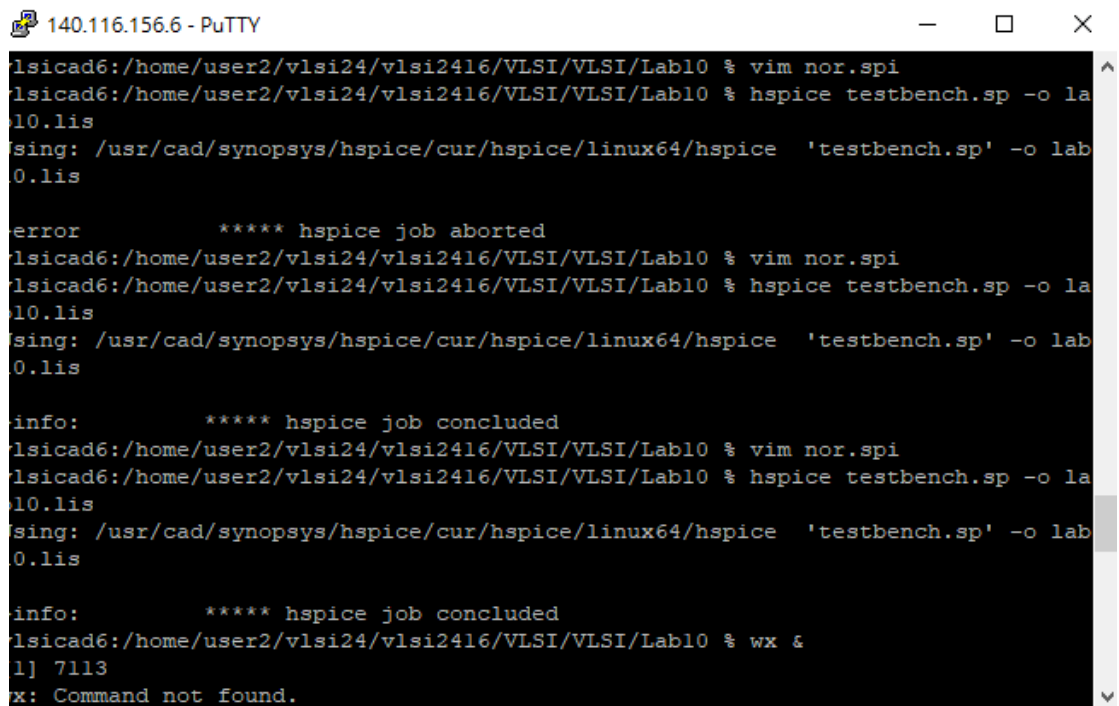
※作業要求的圖請使用 **電腦截圖程式** 截取，請勿用手機拍照的方式繳交

※Report 檔請以 pdf 的格式繳交

#### A. XOR

##### 1. Presim

- i. 請截取 terminal 顯示 job concluded 的圖



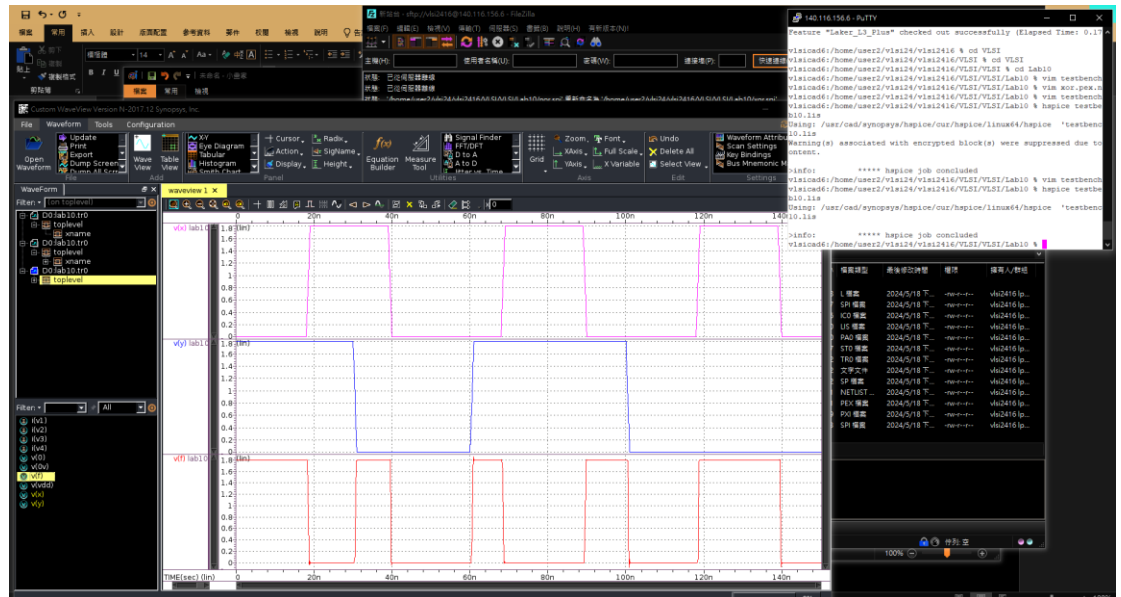
```
140.116.156.6 - PuTTY
lsicad6:/home/user2/vlsi24/vlsi2416/VLSI/VLSI/Lab10 % vim nor.spi
lsicad6:/home/user2/vlsi24/vlsi2416/VLSI/VLSI/Lab10 % hspice testbench.sp -o lab10.lis
sing: /usr/cad/synopsys/hspice/cur/hspice/linux64/hspice 'testbench.sp' -o lab0.lis

error          ***** hspice job aborted
lsicad6:/home/user2/vlsi24/vlsi2416/VLSI/VLSI/Lab10 % vim nor.spi
lsicad6:/home/user2/vlsi24/vlsi2416/VLSI/VLSI/Lab10 % hspice testbench.sp -o lab10.lis
sing: /usr/cad/synopsys/hspice/cur/hspice/linux64/hspice 'testbench.sp' -o lab0.lis

info:          ***** hspice job concluded
lsicad6:/home/user2/vlsi24/vlsi2416/VLSI/VLSI/Lab10 % vim nor.spi
lsicad6:/home/user2/vlsi24/vlsi2416/VLSI/VLSI/Lab10 % hspice testbench.sp -o lab10.lis
sing: /usr/cad/synopsys/hspice/cur/hspice/linux64/hspice 'testbench.sp' -o lab0.lis

info:          ***** hspice job concluded
lsicad6:/home/user2/vlsi24/vlsi2416/VLSI/VLSI/Lab10 % wx &
l] 7113
x: Command not found.
```

- ii. 請截取 WaveView 中的波形



## 2. Post-sim

i. 請截取 terminal 顯示 job concluded 的圖

```

140.116.156.6 - PuTTY

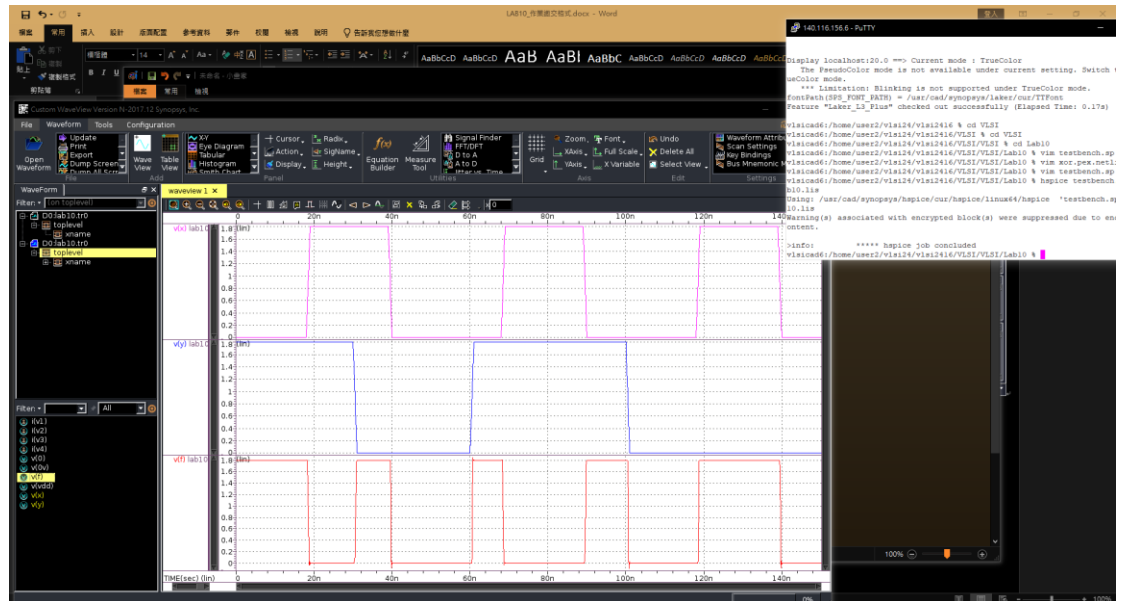
Display localhost:20.0 ==> Current mode : TrueColor
The PseudoColor mode is not available under current setting. Switch to use TrueColor mode.
*** Limitation: Blinking is not supported under TrueColor mode.
fontPath(SPS_FONT_PATH) = /usr/cad/synopsys/laker/cur/TTFont
Feature "Laker_L3_Plus" checked out successfully (Elapsed Time: 0.17s)

vlsicad6:/home/user2/vlsi24/vlsi2416 % cd VLSI
vlsicad6:/home/user2/vlsi24/vlsi2416/VLSI % cd VLSI
vlsicad6:/home/user2/vlsi24/vlsi2416/VLSI/VLSI % cd Lab10
vlsicad6:/home/user2/vlsi24/vlsi2416/VLSI/VLSI/Lab10 % vim testbench.sp
vlsicad6:/home/user2/vlsi24/vlsi2416/VLSI/VLSI/Lab10 % vim xor.pex.netlist
vlsicad6:/home/user2/vlsi24/vlsi2416/VLSI/VLSI/Lab10 % vim testbench.sp
vlsicad6:/home/user2/vlsi24/vlsi2416/VLSI/VLSI/Lab10 % hspice testbench.sp -o lab10.lis
Using: /usr/cad/synopsys/hspice/cur/hspice/linux64/hspice 'testbench.sp' -o lab10.lis
Warning(s) associated with encrypted block(s) were suppressed due to encrypted content.

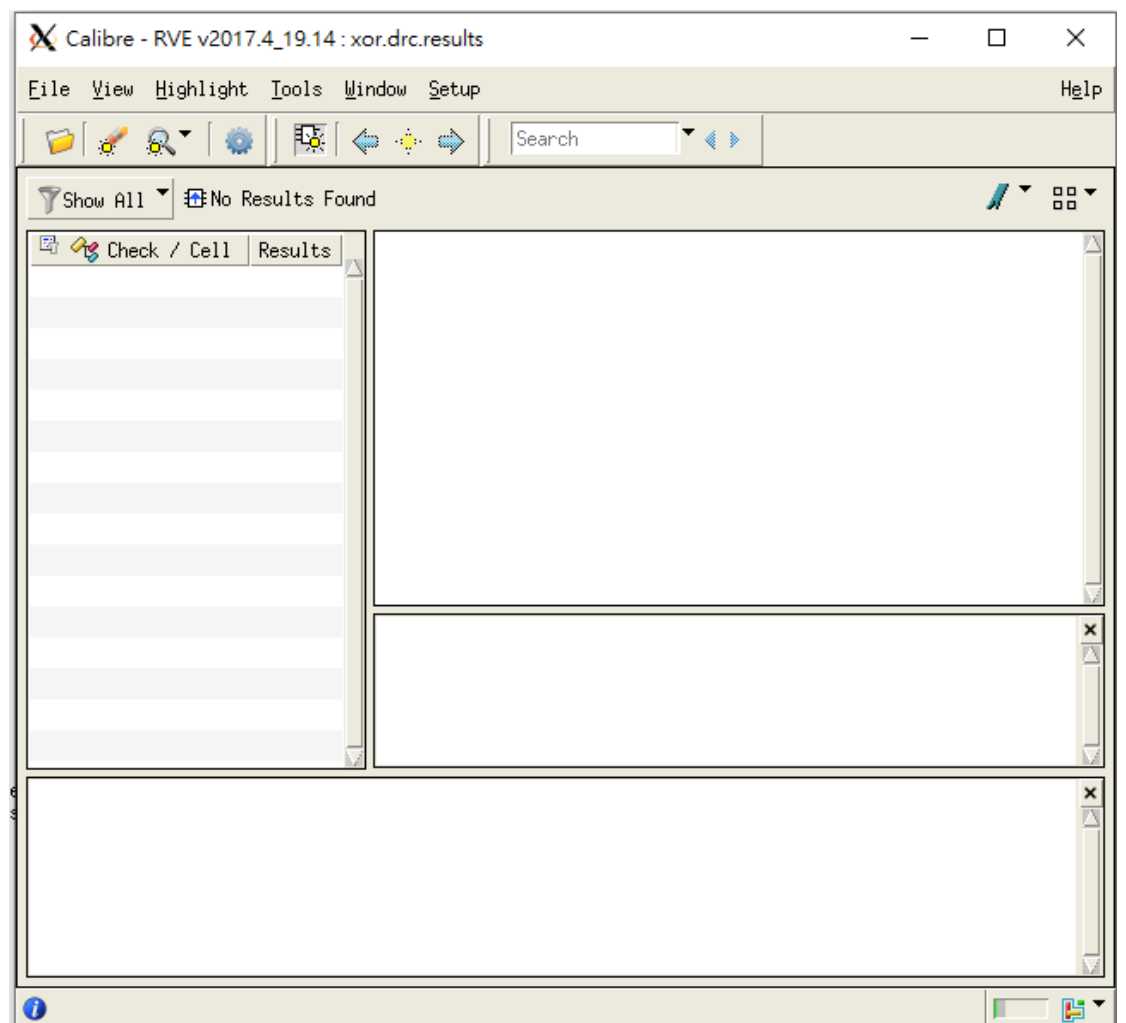
>info: ***** hspice job concluded
vlsicad6:/home/user2/vlsi24/vlsi2416/VLSI/VLSI/Lab10 %

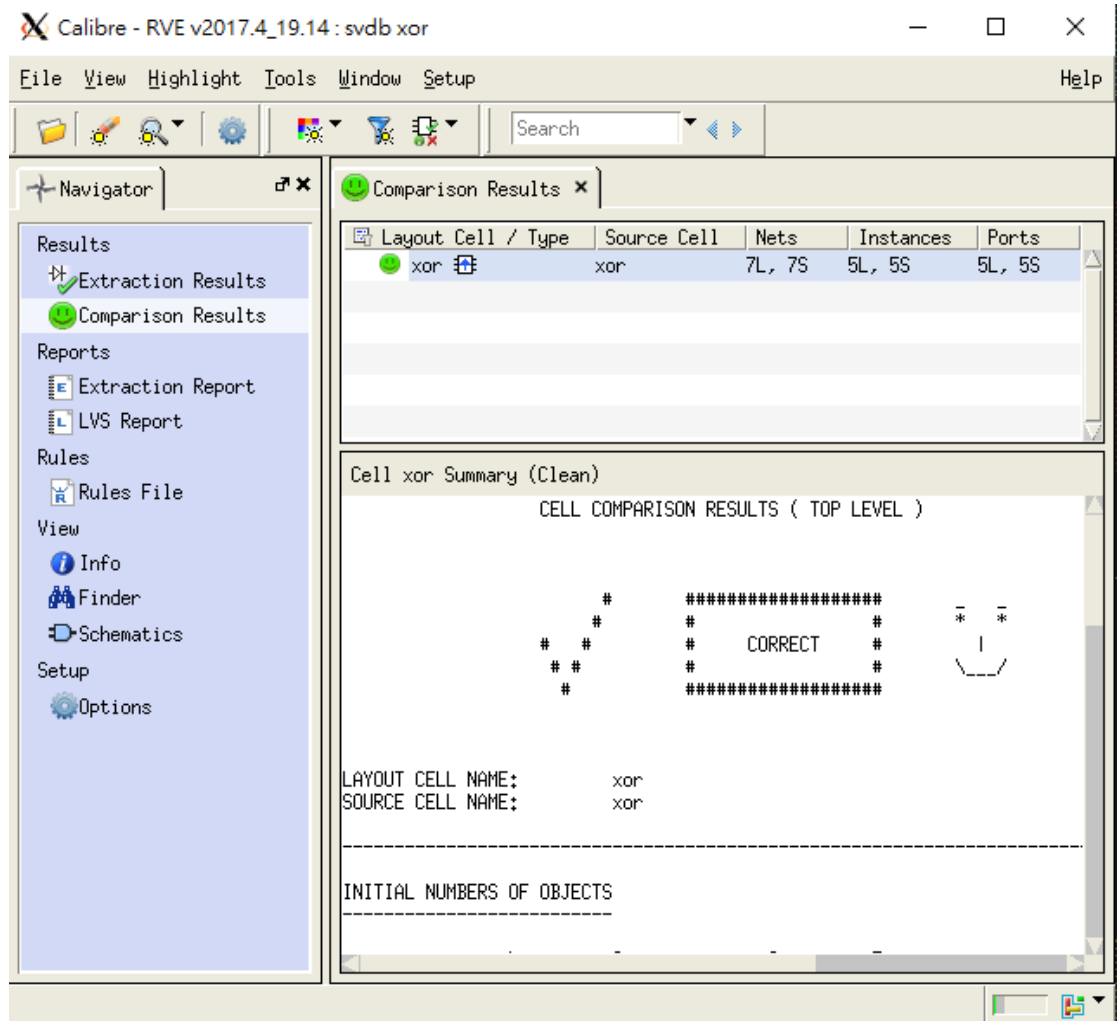
```

ii. 請截取 WaveView 中的波形

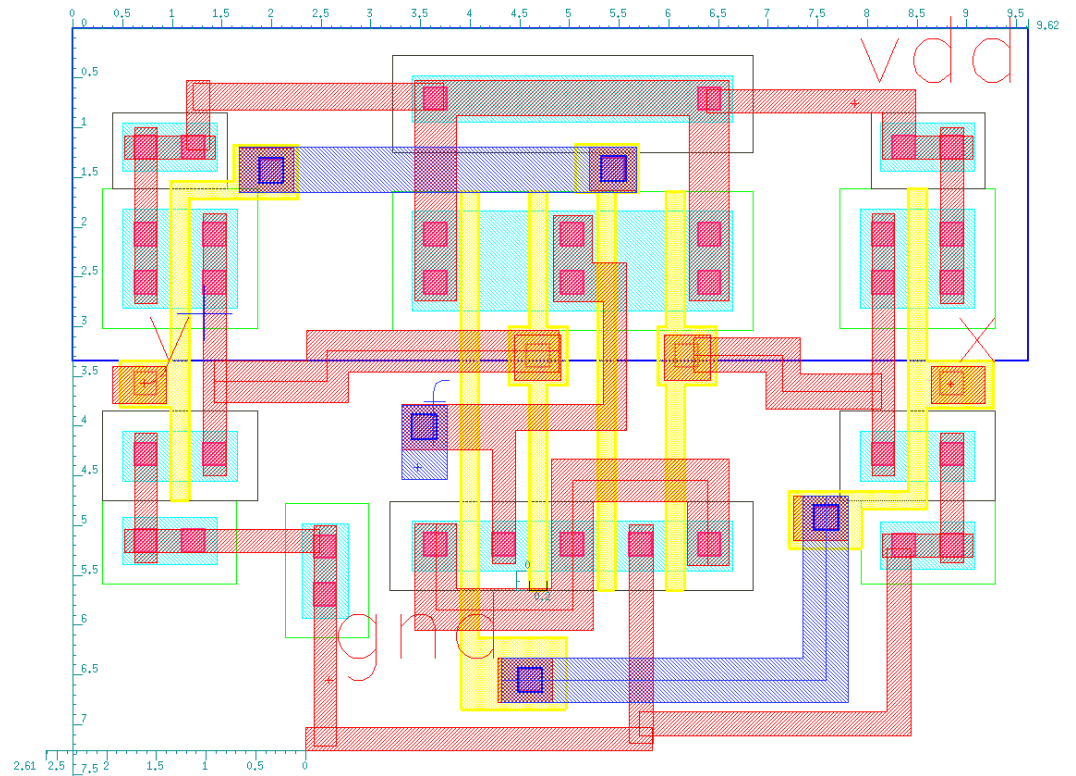


### iii. DRC/LVS 結果





iv. Layout 截圖(顯示長寬)



### 3. 嘗試簡單說明 Presim 與 Post-sim 結果比較

可以觀察出兩者的波型十分相像，我認為這蠻正常的，會有差的地方可能只有電路的延遲而已。

#### B. 心得討論

這次 lab 學到了關於 stick diagram 的畫法，並且運用這個去完成我們的 layout，可以說有了它我們對於空間的編排可以更佳的有效率，也可以化簡對於 cont 的使用。