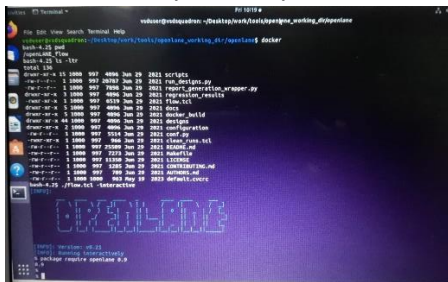


## LABS AND PRACTICALS

- Got started seeing Kunal sir's videos and downloaded the Vdi file and virtual box
- Listened to day 1 theory and did the following labs

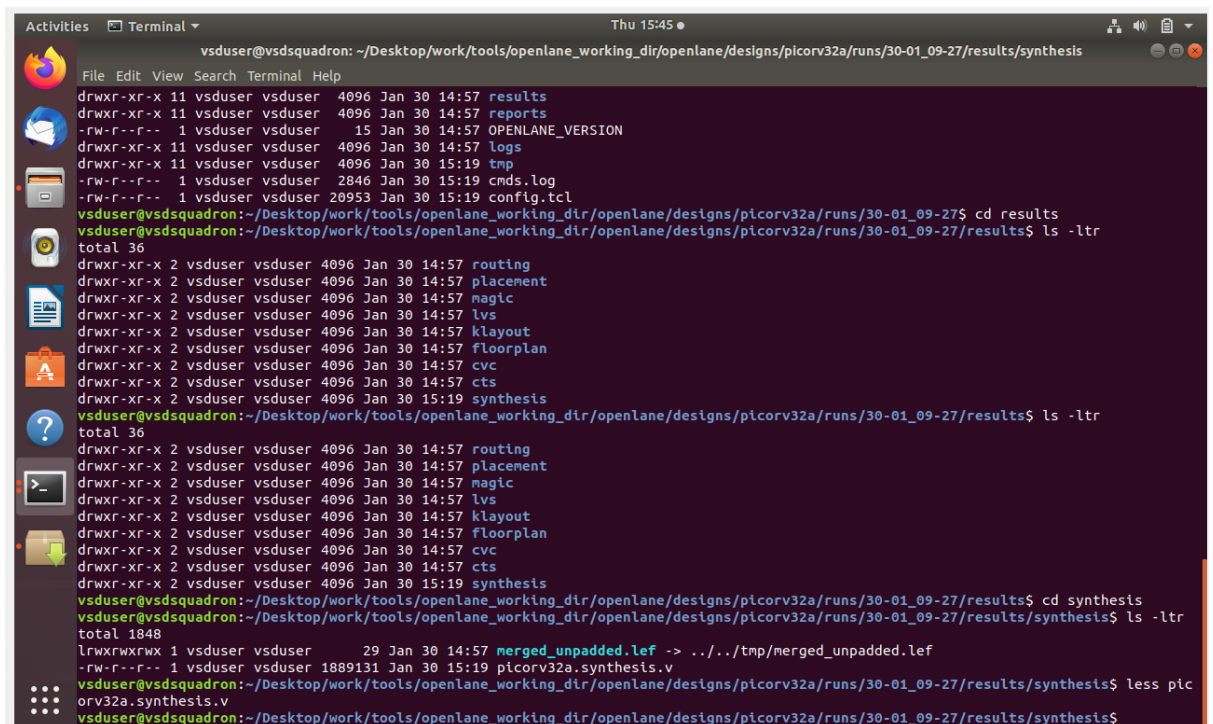


$$0.1084296853993009 \times 100 = 10.84296853993009$$

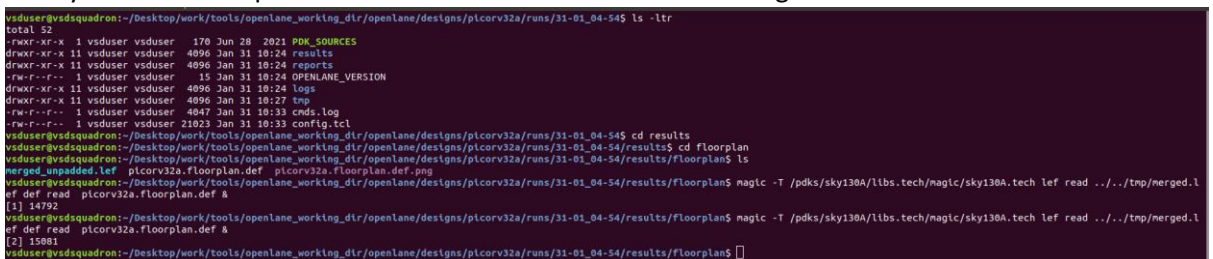
$$1613 \div 14876 =$$

$$0.1084296853993009$$

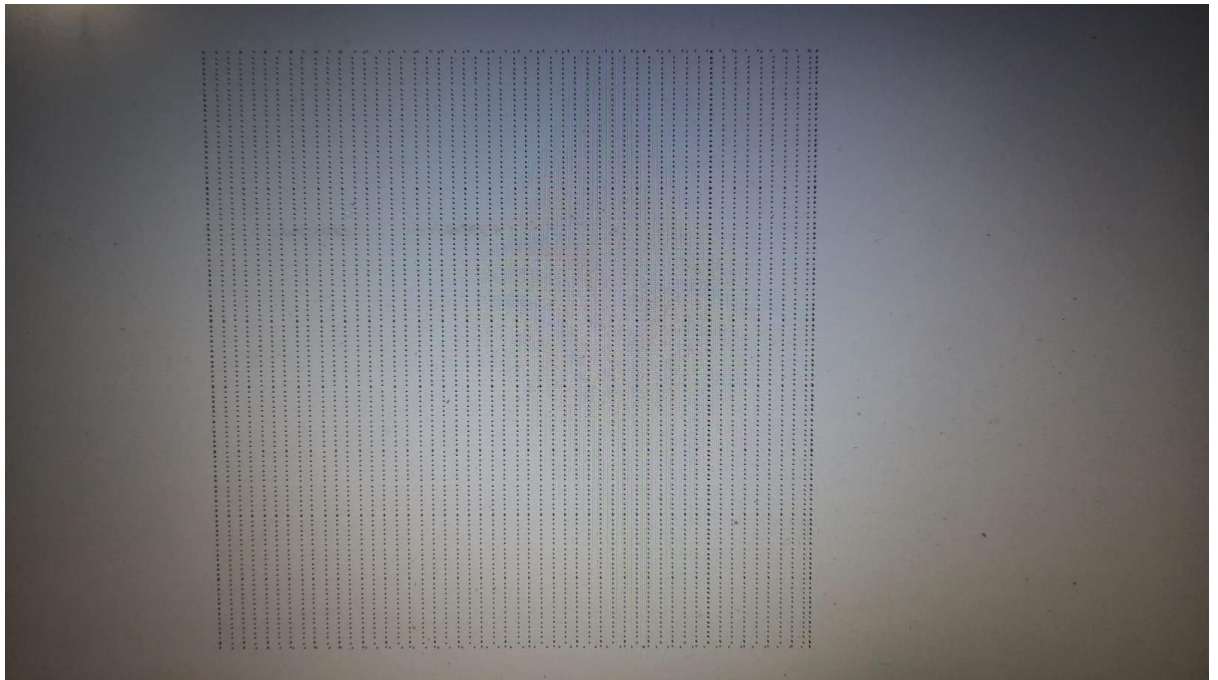
- found the flop ratio by dividing DFF by no. of cells
- Learnt to open terminals and other shortcut keys for Linux



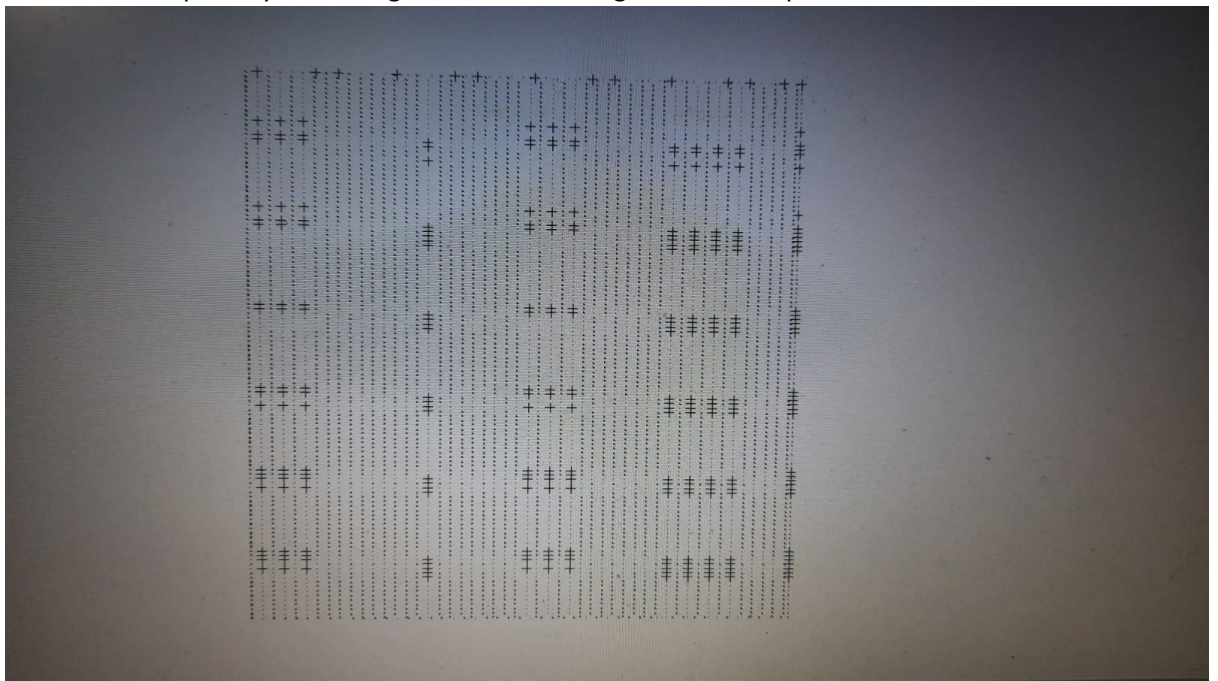
- Ran synthesis after Openlane. observed new runs folder and merged lef



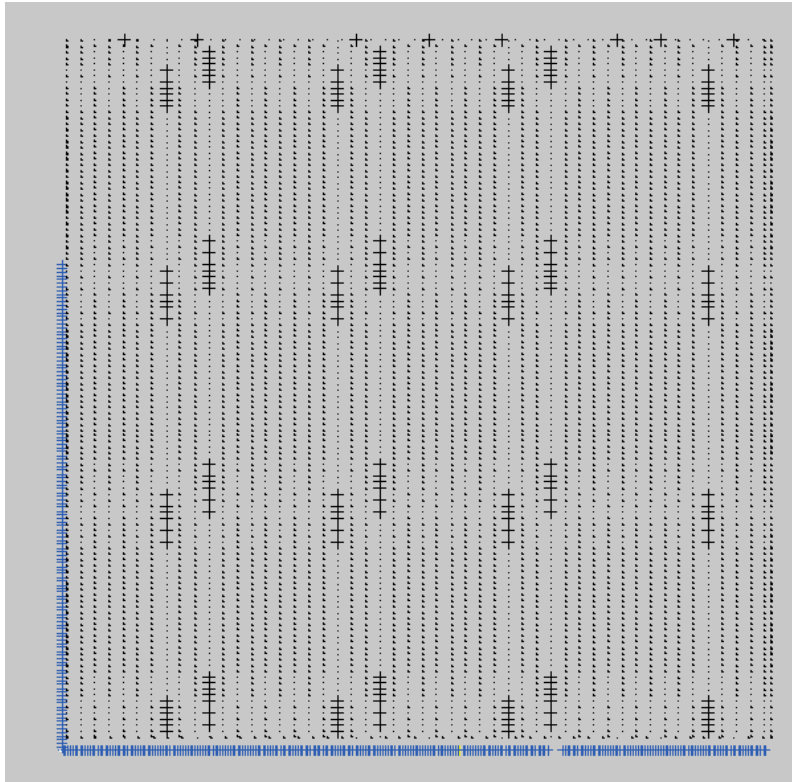
- Learnt to run the floorplan and use magic



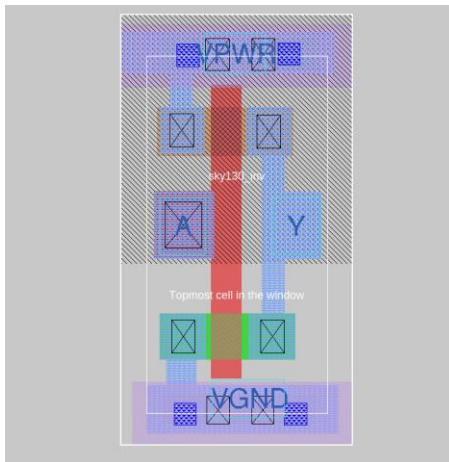
- 
- Reviewed floorplan layout in magic and started congestion aware placement



-



- 
- Abutment
- Git cloned the vsdstdccl



- 
- The green is n diffusion and brown is p diffusion
- How to use tkcon

```
% what
Selected mask layers:
    nwell    ( Topmost cell in the window )
%
```

- 
- DRC lab

```

vdsuser@vdsquadron:~/desktop/work/tools/openlane_working_dir/openlane/vsdstdcelldesign$ ls -ltr
total 184
-rw-rw-r-- 1 vdsuser vdsuser 13525 Jan 31 15:00 README.md
-rw-rw-r-- 1 vdsuser vdsuser 11357 Jan 31 15:00 LICENSE
drwxrwxr-x 2 vdsuser vdsuser 4096 Jan 31 15:00 Images
drwxrwxr-x 2 vdsuser vdsuser 4096 Jan 31 15:00 extras
drwxrwxr-x 2 vdsuser vdsuser 4096 Jan 31 15:00 libs
-rw-rw-r-- 1 vdsuser vdsuser 2716 Jan 31 15:00 sky130_inv.mag
-rwxr-xr-x 1 vdsuser vdsuser 136710 Jan 31 15:06 sky130A.tech
-rw-rw-r-- 1 vdsuser vdsuser 1305 Feb  1 15:39 sky130_inv.ext
vdsuser@vdsquadron:~/desktop/work/tools/openlane_working_dir/openlane/vsdstdcelldesign$ ls -ltr
total 188
-rw-rw-r-- 1 vdsuser vdsuser 13525 Jan 31 15:00 README.md
-rw-rw-r-- 1 vdsuser vdsuser 11357 Jan 31 15:00 LICENSE
drwxrwxr-x 2 vdsuser vdsuser 4096 Jan 31 15:00 Images
drwxrwxr-x 2 vdsuser vdsuser 4096 Jan 31 15:00 extras
drwxrwxr-x 2 vdsuser vdsuser 4096 Jan 31 15:00 libs
-rw-rw-r-- 1 vdsuser vdsuser 2716 Jan 31 15:00 sky130_inv.mag
-rwxr-xr-x 1 vdsuser vdsuser 136710 Jan 31 15:06 sky130A.tech
-rw-rw-r-- 1 vdsuser vdsuser 1305 Feb  1 15:39 sky130_inv.ext
-rw-rw-r-- 1 vdsuser vdsuser 404 Feb  1 15:42 sky130_inv.spice
vdsuser@vdsquadron:~/desktop/work/tools/openlane_working_dir/openlane/vsdstdcelldesign$

```

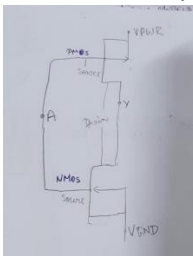
```

* SPICE3 file created from sky130_inv.ext - technology: sky130A
.option scale=0.01u
X0 A VDD VDD sky130_inv A Y VPWR VDD
X1 A VDD VDD sky130_inv _nret_01v0 ad=1.44n pd=0.152n as=1.37n ps=0.148n w=35 l=23
X2 A VDD VDD sky130_inv _pnet_01v0 ad=1.44n pd=0.152n as=1.37n ps=0.148n w=37 l=23
VDD VPWR 0 3.3V
VSS VGND 0 0V
VA A VGND PULSE(0V 3.3V 0 0.1ns 0.1ns 4ns
C0 VPWR Y 0.117f
C1 A Y 0.0754f
C2 A VPWR 0.0774f
C3 Y VGND 0.279f
C4 A VGND 0.45f
C5 VPWR VGND 0.781f
//l.ends

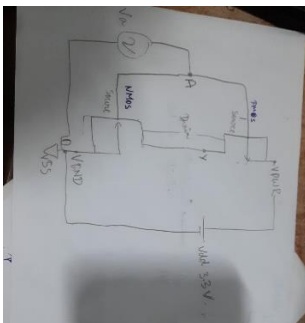
```

Extracting spice netlist given above

- Then to identify connections



- Next task to connect VGND to VSS [a ground] and supply voltage to be connected from VPWR to VGND for transcend analysis to take place AS ILLUSTRATED



- We must follow the steps for the above required

```

Firefox Web Browser Terminal Help
* SPICE3 file created from sky130_inv.ext - technology: sky130A
.option scale=0.01u
.include ./libs/pshort.lib
.include ./libs/nshort.lib
//.subckt sky130_inv A Y VPWR VGND
X0 A VDD VDD sky130_inv _nret_01v0 ad=1.44n pd=0.152n as=1.37n ps=0.148n w=35 l=23
X1 A VDD VDD sky130_inv _pnet_01v0 ad=1.44n pd=0.152n as=1.37n ps=0.148n w=37 l=23
VDD VPWR 0 3.3V
VSS VGND 0 0V
VA A VGND PULSE(0V 3.3V 0 0.1ns 0.1ns 4ns
C0 VPWR Y 0.117f
C1 A Y 0.0754f
C2 A VPWR 0.0774f
C3 Y VGND 0.279f
C4 A VGND 0.45f
C5 VPWR VGND 0.781f
//l.ends

```

# PULSE

