

STEP1 :

### Open Source EDA :

1. Skywater-pdk – Contains all the foundry provided PDK related files.
2. Open\_pdks – Contains scripts that are used to bridge the gap between closed-source and open-source PDK to EDA tool compatibility.
3. Sky130A – The open-source compatible PDK files.

```
adevipriya@adevipriya-VirtualBox:~/vsdf/flow/work/tools/openlane_working_dir/openlane/pdks$ ls -ltr
total 12
drwxrwxr-x 9 adevipriya adevipriya 4096 Aug 12 20:25 skywater-pdk
drwxrwxr-x 8 adevipriya adevipriya 4096 Aug 12 20:28 open_pdks
drwxr-xr-x 5 adevipriya adevipriya 4096 Aug 12 20:33 sky130A
```

STEP2 :

### Invoking OpenLane :

```
adevipriya@adevipriya-VirtualBox:~/vsdf/flow/work/tools/openlane_working_dir/openlane$ ./flow.tcl -interactive
[INFO]:

  O P E N L A N E

[INFO]: Version: 2021.08.02_05.21.44
[INFO]: Running interactively
% █
```

- ./flow.tcl is the script which runs the OpenLANE flow.
- OpenLANE can be run interactively or in autonomous mode.
- To run interactively, use the -interactive option with the ./flow.tcl script.

STEP3 :

### Package Importing :

```
adevipriya@adevipriya-VirtualBox:~/vsdfLOW/work/tools/openlane_working_dir/openlane$ ./flow.tcl -interactive
[INFO]:

  O P E N L A N E

[INFO]: Version: 2021.08.02_05.21.44
[INFO]: Running interactively
% package require openlane
0.9
% 
```

STEP4 :

### Design Folder :

All designs run within OpenLANE are extracted from the openlane/designs folder :

```
adevipriya@adevipriya-VirtualBox:~/vsdfLOW/work/tools/openlane_working_dir/openlane/designs$ ls
151      cic_decimator      ocs_blitter      spm
aes       des                picorv32a        synth_ram
aes128    des3              point_add        usb
aes192    digital_pll_sky130_fd_sc_hd  point_scalar_mult  usb_cdc_core
aes256    genericfir        PPU              usbf_device
aes_cipher  inverter          README.md        wbqspiflash
aes_core   jpeg_encoder       s44              xtea
APU        ldpc_decoder_802_3an  salsa20          y_dct
blabla    ldpcenc           sha3              y_huff
BM64      manual_macro_placement_test  sha512           zipdiv
chacha    md5               sound
```

STEP5 :

### Design Folder Hierarchy :

```
adevipriya@adevipriya-VirtualBox:~/vsdf/flow/work/tools/openlane_working_dir/openlane/designs/picorv32a$ ls -ltr
total 28
drwxrwxr-x 2 adevipriya adevipriya 4096 Aug 12 18:41 src
-rw-rw-r-- 1 adevipriya adevipriya 209 Aug 12 18:41 sky130A_sky130_fd_sc_ms_config.tcl
-rw-rw-r-- 1 adevipriya adevipriya 209 Aug 12 18:41 sky130A_sky130_fd_sc_ls_config.tcl
-rw-rw-r-- 1 adevipriya adevipriya 209 Aug 12 18:41 sky130A_sky130_fd_sc_hs_config.tcl
-rw-rw-r-- 1 adevipriya adevipriya 209 Aug 12 18:41 sky130A_sky130_fd_sc_hdll_config.tcl
-rwxrwxr-x 1 adevipriya adevipriya 209 Aug 12 18:41 sky130A_sky130_fd_sc_hd_config.tcl
-rwxrwxr-x 1 adevipriya adevipriya 444 Aug 12 18:41 config.tcl
```

1. Src folder - Contains verilog files and sdc constraint files.
2. Config.tcl files - Design specific configuration switches used by OpenLANE.

STEP6 :

### Prepare Design :

```
adevipriya@adevipriya-VirtualBox:~/vsdf/flow/work/tools/openlane_working_dir/openlane/designs/picorv32a/runs$ ls -ltr
total 12
drwxrwxr-x 6 adevipriya adevipriya 4096 Aug 13 16:51 13-08_16-51
drwxrwxr-x 6 adevipriya adevipriya 4096 Aug 13 16:53 runs
drwxrwxr-x 6 adevipriya adevipriya 4096 Aug 13 16:58 workshop
```

```
adevipriya@adevipriya-VirtualBox:~/vsdf/flow/work/tools$ ls -ltr
total 17960
-rw-r--r-- 1 adevipriya adevipriya 8614802 Nov 21 2018 cmake-3.13.0.tar.gz
-rw-r--r-- 1 adevipriya adevipriya 4026227 Aug 12 2020 magic-8.3.50.tgz
-rw-r--r-- 1 adevipriya adevipriya 4049065 Aug 11 12:30 magic-8.2.172.tgz
-rw-r--r-- 1 adevipriya adevipriya 529894 Aug 11 12:30 netgen-1.5.134.tgz
-rw-r--r-- 1 adevipriya adevipriya 785313 Aug 11 12:30 qflow-1.3.17.tgz
-rw-r--r-- 1 adevipriya adevipriya 332518 Aug 11 12:30 qrouter-1.4.59.tgz
drwxr-xr-x 15 adevipriya adevipriya 4096 Aug 11 13:12 cmake-3.13.0
drwxr-xr-x 9 adevipriya adevipriya 4096 Aug 11 13:16 graywolf
drwxr-xr-x 3 adevipriya adevipriya 4096 Aug 11 13:16 qrouter-1.4.59
drwxr-xr-x 44 adevipriya adevipriya 4096 Aug 11 13:17 magic-8.3.50
drwxr-xr-x 11 adevipriya adevipriya 4096 Aug 11 13:17 netgen-1.5.134
drwxr-xr-x 5 adevipriya adevipriya 4096 Aug 11 13:18 qflow-1.3.17
drwxr-xr-x 23 adevipriya adevipriya 4096 Aug 11 13:18 OpenSTA
drwxr-xr-x 18 adevipriya adevipriya 4096 Aug 11 13:28 OpenTimer
drwxr-xr-x 5 adevipriya adevipriya 4096 Aug 12 20:39 openlane_working_dir
drwxrwxr-x 13 adevipriya adevipriya 4096 Aug 12 21:00 OpenROAD
```