# STEPS TO INSTALL OPENROAD TOOLS

1. If u have windows machine, download virtualbox box from https://www.virtualbox.org/wiki/Downloads
2. In virtual box, create a new machine.
   - Choose desired name and location
   - Type-Linux
   - Version-Redhat (32/64 bit)
   - Based on your computer RAM, assign half of the RAM to the virtual machine. At least 4 GB must be allotted.
   - Keep everything default and go forward.
   - Allot dynamic memory based on your computer memory. At least 40 GB is preferred.
3. Download CentOS 7 iso from https://www.centos.org/download/
4. In your newly created virtual machine, in the storage section, click on empty optical drive and insert the downloaded ISO. Finally, start the virtual machine.
5. Installing CentOS:
   - Select your language preference, Region, and keyboard language.
   - In software selection, select server with GUI.
   - In System, for installation destination, you can select automatic partition or manual partition.
   - Click on begin install
   - Setup your password and create user.
6. Installing OpenROAD from terminal:
   - Cloning repository:
     - git clone --recursive https://github.com/The-OpenROAD-Project/OpenROAD-flow.git
     - cd OpenROAD-flow
   - Installing docker:
     - Install needed packages:
       - sudo yum install -y yum-utils device-mapper-persistent-data lvm2
     - Configure the docker-ce repo:
       - Sudo yum-config-manager --add-repo https://download.docker.com/linux/centos/docker-ce.repo
     - Install docker-ce:
       - sudo yum install docker-ce
     - Add your user to the docker group with the following command.
       - sudo usermod -aG docker $(whoami)
     - Set Docker to start automatically at boot time:
       - sudo systemctl enable docker.service
     - Finally, start the Docker service:
       - sudo systemctl start docker.service
   - Building docker:
     - ./build_openroad.sh
7. Installing KLayout:
   - yum group install –y "Development Tools" && \
     yum update –y && yum install –y libffi-devel python3 tcl-devel which time && \
     yum localinstall https://www.klayout.org/downloads/CentOS_7/klayout-0.26.4-0.x86_64.rpm -y
8. Running sample RTL2GDS flow:
   - Start an interactive shell in a docker container using your user credentials
     - docker run -it -u $(id -u ${USER}):$(id -g ${USER}) openroad/flow bash
   - Update your container environment
     - source ./setup_env.sh
   - sample design flow:
     - cd flow (in docker container)
     - uncomment the desired design from Makefile
     - make DESIGN_CONFIG=./designs/path.design/name.mk (in docker container)
     - Copying gds file from docker container to host (in working area):
       - sudo docker ps
       - docker cp <container_name: /file/path/within/container /file/path/in/host
     - klayout <file.gds>