**Install xschem**

Method 1-----

<https://youtu.be/jXmmxO8WG8s>

<https://xschem.sourceforge.io/stefan/xschem_man/install_xschem.html>

<https://anthonywall.ie/opentools/>

*sudo apt install build-essential -y*

*sudo apt-get instsll flex -y*

*sudo apt-get install -y libx11-dev*

*sudo apt-get install -y tk8.6-dev*

*sudo apt-get install -y libxxpm-dev* flex bison

*git clone https://github.com/StefanSchippers/xschem.git xschem-src*

*cd xschem-src*

*./configure*

*make*

*sudo make install*

method 2-----

*sudo apt -y install xschem*

check the program location

*whereis xschem*

**install Magic**

*cd /home/..../Desktop*

*git clone git://opencircuitdesign.com/magic*

*cd magic*

*sudo apt-get install m4 tcsh csh libx11-dev tcl-dev tk-dev libcairo2-dev mesa-common-dev libglu1-mesa-dev libncurses-dev -y*

*./configure*

*make*

*sudo make install*

*make distclean*

**Install sky130**

Method 1-----

Method 2-----

<https://www.engineerwikis.com/wikis/installation-of-xschem>

cd …… Desktop

git clone https://github.com/google/skywater-pdk

cd skywater-pdk

git submodule init libraries/sky130\_fd\_io/latest

git submodule init libraries/sky130\_fd\_pr/latest

git submodule init libraries/sky130\_fd\_sc\_hd/latest

git submodule init libraries/sky130\_fd\_sc\_hdll/latest

# optional -----------

git submodule init libraries/sky130\_fd\_sc\_hs/latest

git submodule init libraries/sky130\_fd\_sc\_ms/latest

git submodule init libraries/sky130\_fd\_sc\_ls/latest

git submodule init libraries/sky130\_fd\_sc\_lp/latest

git submodule init libraries/sky130\_fd\_sc\_hvl/latest

# --------------------

# You can skip the above optional command. But the following two commands must be run.

git submodule update

make timing

**Install open\_pdks**

cd …./Desktop

git clone git://opencircuitdesign.com/open\_pdks

cd open\_pdks

./configure --enable-sky130-pdk=/home/……./Desktop/skywater-pdk

make

sudo make install

make distclean

**install Ngspice**

sudo apt-get install adms autoconf libtool libxaw7-dev libc6-dev gawk -y

sudo apt update

sudo apt upgrade

sudo apt-get install manpages-dev man-db manpages-posix-dev libreadline6-dev -y

sudo apt-get update -y

cd /home/...../Desktop

git clone <https://github.com/ngspice/ngspice.git>

cd ngspice

./autogen.sh –adms

mkdir release

cd release

./configure --with-x --with-readline=yes --disable-debug

make

sudo make install

**cd ~/.xschem**

**mkdir simulations**

**sudo nano .spiceinit-----[** **set ngbehavior=hs]**

**-----------------**

**Run iverilo/icarus**

iverilog file.v

vvp a.out

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Install pyspice