Project-5 (20 points):

An intent of this project is to guide you

1. To understand GDS (its format and its parser); then, create some GDS objects; how to traverse those objects; and very importantly how to query those objects?

(Note: from there, we can extend to learn how to write out GDS).

1. How to render layout objects through QT? how to query an object in a QT window? In the query, a cursor location (x, y) is obtained. Then, collect the objects underneath this location.

First, please study GDS format (a link to a good GDS introduction is in the .ppt.) Then, study the parser codes (a link to a parser in GitHub is in the .ppt). We already put a .zip file at

/home/course/jtli/test/object\_viewer\_02102023/object\_viewer\_02102023.zip

which contains a GDS parser (/gdsFileParser) and sample QT codes.

1. Then, learn how to add menu and toolbar through QT. Then, call GDSII parser from the menu and toolbar.
2. Build object\_viewer through QT to see the GDSII objects. An important exercise is to learn how to use this asynchronous programming, i.e., an event queue is created to wait for any mouse event to happen, and then, process.

How to compile the codes? Below are the steps:

# below is to compile Karl's and Honda's codes (GDS & object viewing). EE/IT already installed a good QT version at /opt/qt-5.6.3

1) /opt/qt-5.6.3/bin/qmake -o Makefile object\_viewer.pro

2) make

3) ./object\_viewer

After you can compile, link successfully, you can play round the executable. A few things you can try:

1. We hard codes some shapes. Please find out which files have those codes. Then, please add two more shapes.
2. In display window, please do several queries and get the snapshots. Then, find out which functions are doing the “query” work.
3. Can you try to parse in a GDS file you created in project-3: creating layouts for differential pairs.

Then, submit your reports.

Welcome to compile with “-g”; then, use gdb to trace the codes to learn. These are excellent examples for you to study.