

# Automatic Placement and Routing using Synopsys IC Compiler

CS250 Tutorial 6 (Version 100609a)

October 6, 2009

Yunsup Lee

This is an early version of tutorial 6 which is not done yet. In this tutorial you will gain experience using Synopsys IC Compiler to probe your design.

The following documentation is located in the course locker (~cs250/docs/manuals) and provides additional information about Design Compiler, Design Vision, the Design Ware libraries, and the Synopsys 90nm Standard Cell Library.

- `icc-user-guide.pdf` - IC Compiler Implementation User Guide
- `icc-quick-reference.pdf` - IC Compiler Quick Reference
- `icc_dp-user-guide.pdf` - IC Compiler Design Planning User Guide
- `synopsys-90nm-databook-stdcells.pdf` - Digital Standard Cell Library Databook
- `synopsys-90nm-databook-memories.pdf` - Memory Databook
- `synopsys-90nm-databook-opensparc.pdf` - OpenSparc Megacell Databook

## Getting started

Before using the CS250 toolflow you must run the course setup script with the following command.

```
% source ~cs250/tools/cs250.bashrc
```

## Reporting the Total Area

Run IC Compiler using the following commands. If you have already place and routed your design, you can skip the `make` command.

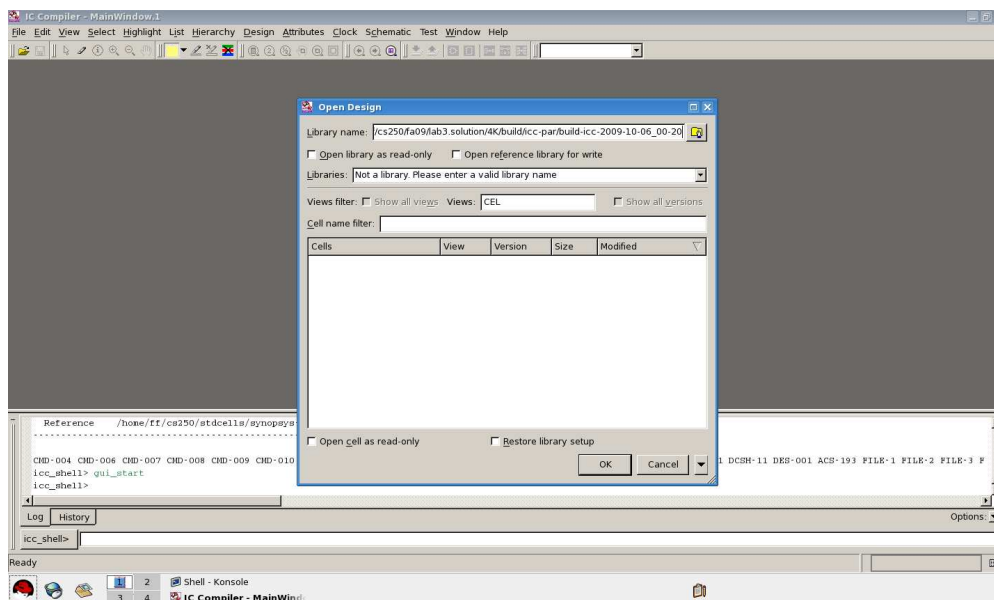
```
% cd $TUT6_ROOT/build/icc-par/current-icc
% make
% icc_shell
icc_shell> source icc_setup.tcl
icc_shell> open_mw_lib $MW_DESIGN_LIBRARY
icc_shell> open_mw_cel $ICC_CHIP_FINISH_CEL
icc_shell> report_area -hierarchy
```

## Highlighting the Hierarchy

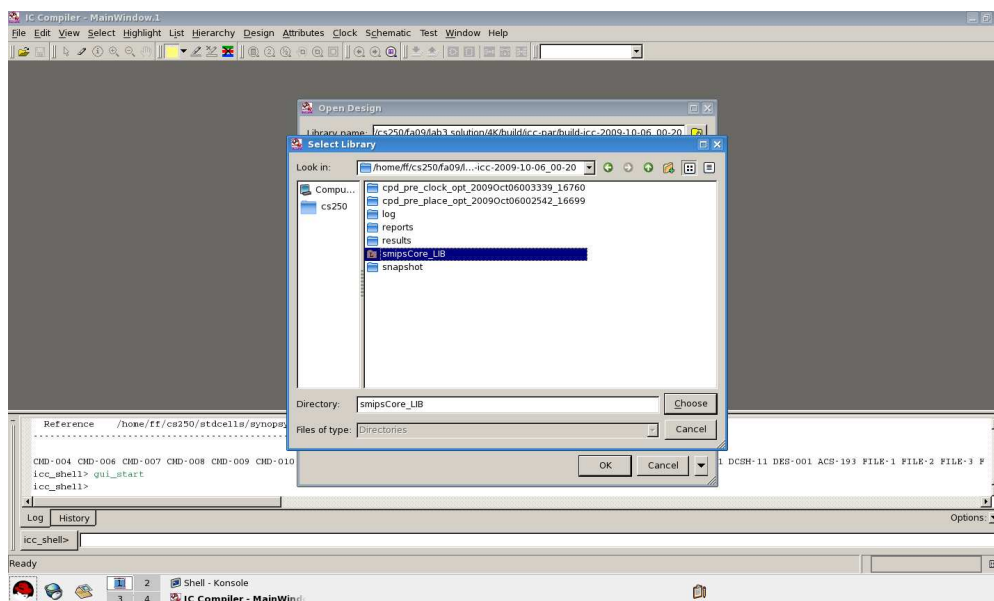
Run IC Compiler using the following commands.

```
% cd $TUT6_ROOT/build/icc-par/current-icc
% icc_shell
icc_shell> source icc_setup.tcl
icc_shell> gui_start
```

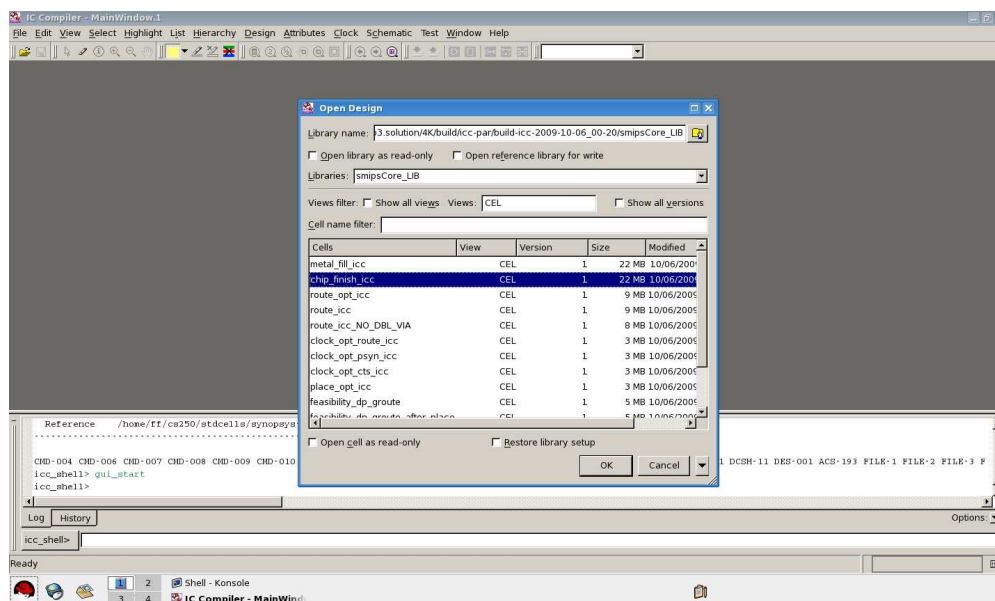
Then open your `chip_finish_icc` cell by following the steps. First, start with *File > Open Design*.



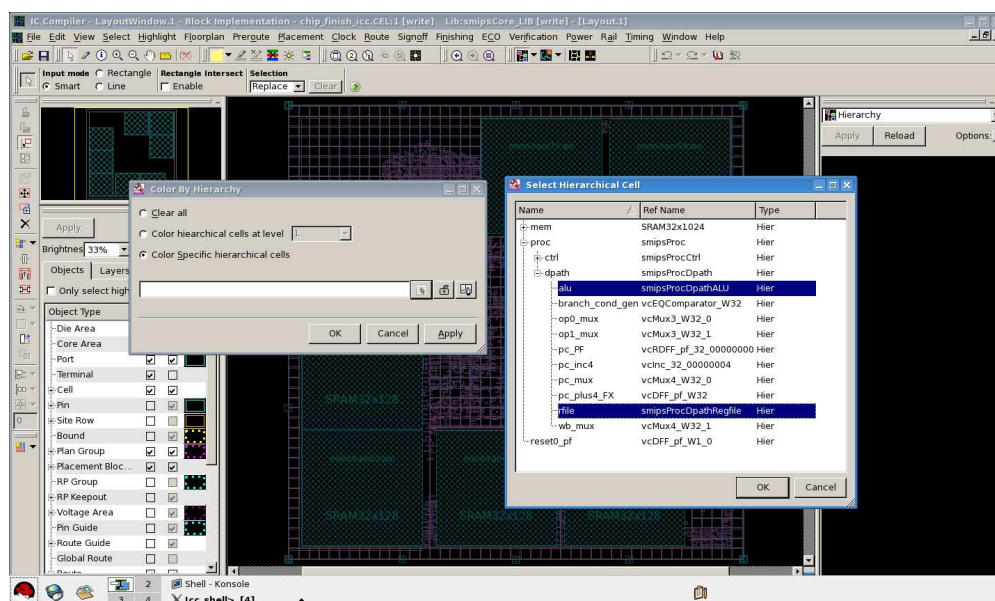
Open `smipsCore_LIB`.



Select `chip_finish_icc`.



Choose *Placement > Color by Hierarchy*. Then hit *Reload*. Pick *Color Specific hierarchical cells*. Then select the button on the most right which is for *Browse for cells*. Pick your register file and ALU from the list.



Now you will get highlighted cells from your design.

## Acknowledgements

Many people have contributed to versions of this tutorial over the years. The tutorial was originally developed for 6.375 Complex Digital Systems course at Massachusetts Institute of Technology by Christopher Batten. Contributors include: Krste Asanović, John Lazzaro, Yunsup Lee, and John Wawrzynek. Versions of this tutorial have been used in the following courses:

- 6.375 Complex Digital Systems (2005-2009) - Massachusetts Institute of Technology
- CS250 VLSI Systems Design (2009) - University of California at Berkeley