Computer-Aided VLSI System Design
Homework 5: APR

TA: 李諭奇 d06943027@ntu.edu.tw **Due Tuesday, Jan. 4, 14:00**

TA: 羅宇呈 f08943129@ntu.edu.tw

Data Preparation

1. You would need related files below to finish APR
   (You can find all files under **/home/raid7_4/raid1_1/ PnR/SOCE_Lab/library**)
   - **design**
     A. Your ipdc_syn.v from HW3
     B. Your ipdc_syn.sdc from HW3
   - **celtic**
     A. slow.cdB
   - **Capacitance Table**
     A. tsmc013.capTbl
   - **tsmc13_8lm.cl**
     A. icecaps_8lm.tch
   - **gds**
     A. tsmc13gfsg_fram.gds
     B. sram_*.gds (in sram_lef.zip)
   - **lef**
     A. tsmc13fsg_8lm_cic.lef
     B. antenna_8.lef
     C. sram_*.vclef (in sram_lef.zip)
     D. sram_*_ant.lef (in sram_lef.zip)
   - **lib**
     A. slow.lib
     B. sram_*_slow_syn.lib
   - streamOut.map

Introduction

In this homework, you should use Innovus to do P&R using your design in **HW3**. Note that the .sdc file are not provided to you. You should create them by yourself.

Specifications

1. Top module name: **ipdc**
2. Only use worst case library for APR.
   - **AV_func_mode_max** for both **Setup Analysis View** and **Hold Analysis View**
3. Generate ipdc_syn.sdc from synthesis stage by below command:

```
write_sdc Netlist/ipdc_syn.sdc -version 1.8
```

4. Process related to IO Pad can be skip if there is no IO Pad in your design.
5. Process related to scan chain can be skip
6. At least one power stripe in your design.
7. Use below command to analyze the area (remember to save your design files first!!)

```
innovus #> analyzeFloorplan
```

Design Description

1. Create 04_APR folder to do the APR.
2. Create 05_POST folder to run simulation after APR.
   - Modify the name of .sdf file in your testbench.

Submission

1. Create a folder named **studentID_hw5**, and put all below files into the folder
   - sdc file for clock tree synthesis
   - ipdc.gds
   - ipdc_pr.v
   - ipdc_pr.sdf
   - mmmc.view
   - report.pdf

   Note: Use **lower case** for the letter in your student ID. (Ex. r07943001_hw1)

2. Compress the folder **studentID_hw5** in a **tar file** named **studentID_hw5_v*k*.tar** (***k* is the number of version, *k* =1,2,…)**

```
tar -cvf studentID_hw5_vk.tar StudentID_hw5
```

   TA will only check the last version of your homework.

   Note: Use **lower case** for the letter in your student ID. (Ex. d06943027_hw5_v1)

3. Submit to FTP
   - IP: 140.112.175.68
   - Port: 21
   - Account: 1101cvsd_student
   - Password: ilovecvsd

Grading Policy

1. TA will run your code with following command. Make sure to run this command with no error message.

```
ncverilog testbed.v ipdc_pr.v tsmc13_neg.v \
          +ncmaxdelays +define+SDF+tb0 +access+r
```

2. APR report: **60%**
3. Correctness of mmmc.view setting: **10%**
4. Correctness of simulation after APR: **30%**