VLSI PDA HW2

Two-way Min-cut Partitioning

Fiduccia-Mattheyses Algorithm

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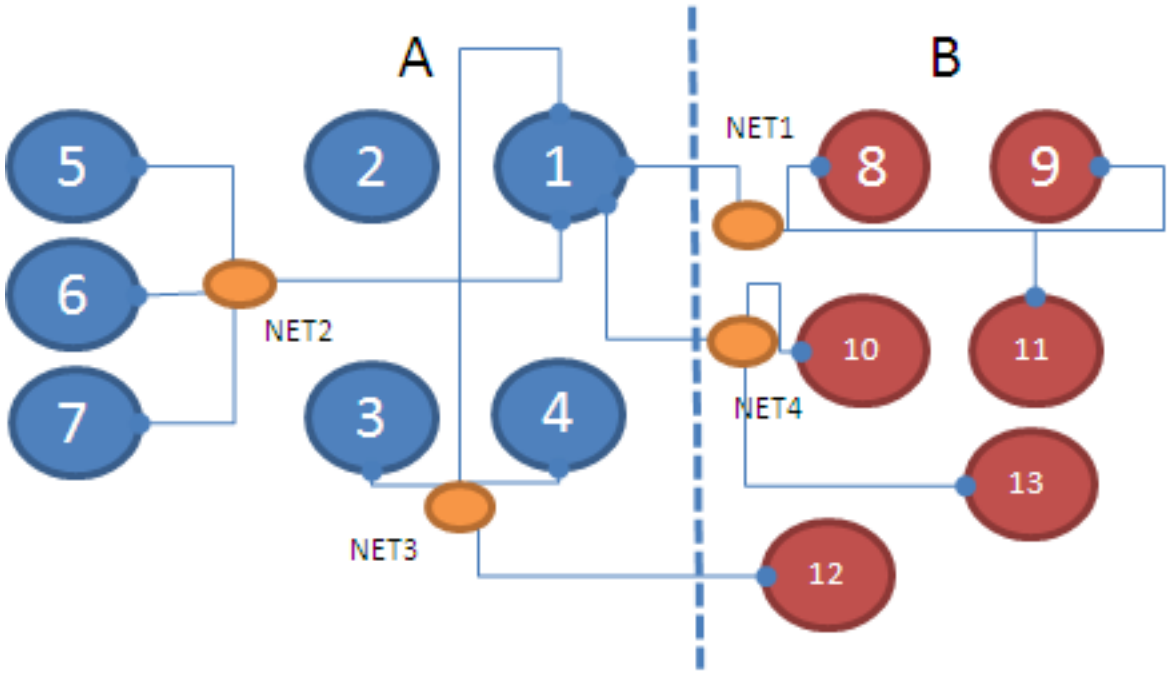

Introduction

Using Language: C++
Compiler/Version: g++ (GCC) 4.8.2 20140120 (Red Hat 4.8.2-15)
(Notice: You must use the g++ compiler that has c++ 11 standard to compile my code!)
OS: Linux/OS X

Results

for p2-1:
- Initial Cut Size = 226
- Final Cut Size = 6
- # of FM Passes = 6
- Total Run Time = 0 sec

for p2-2:
- Initial Cut Size = 3385
- Final Cut Size = 221
- # of FM Passes = 14
- Total Run Time = 0.1 sec

for p2-3:
- Initial Cut Size = 68098
- Final Cut Size = 1630
- # of FM Passes = 18
- Total Run Time = 2.82 sec

Implementation

I build the initial partition while reading input.
I Just greedily check if set A is smaller I put it in set A, otherwise I put it in set B, and finally slightly adjust if ||A|-|B|| >= total cell size/10.
Then follow the FM Algorithm, there is nothing special.

File Structure

CS6135_HW2_101021120/
- CS6135_Hw2_2016.pdf
- CS6135_HW2_101021120_Report.pdf
- bin/
  - FM_Partitioner
  - FM_Partitioner_OSX
- output/
  - p2-1.out
  - p2-2.out

- p2-3.out
- src/
  - README
  - Makefile
  - cell.h
  - net.h
  - main.cp
  - p
- testcases/
  - p2-1.cells
  - p2-1.nets
  - p2-2.cells
  - p2-2.nets
  - p2-3.cells
  - p2-3.nets
- verifier/
  - README
  - verify

“Report.pdf” is this file.
“output/“ contains the results.
“bin/“ contains the executable file “FM_Partitioner.”
“src/” contains the source codes.
“testcases/” is provided by TA.
“verify/” is provided by TA.
“FM_Partitioner” is compiled in Linux
“FM_Partitioner_OSX” is compiled in Mac OS X

How to Compile

Go to the “src/“ directory and type the command: `make`
It will generate the executable file “FM_Partitioner” in the same directory.
If you want to remove it please type the command: `make clean`

How to Run

- **Help Command `[-h?]`**

✓ Format: `./<exe> -h`
✓ E.g. `./FM_Partitioner -h`
✓ Output: Usage: ./FM_Partitioner -c <cells file name> -n <nets file name> -o <output file name>

- **Execution Command `[-cno]`**

- ✓ Format: `./<exe> -c <cells file name> -n <nets file name> -o <output file name>`
- ✓ E.g. `./FM_Partitioner -c ../testcases/p2-1.cells -n ../testcases/p2-1.nets -o p2-1.out`
- ✓ Output: (The experimental result saving in p2-1.out and showing on screen)

Initial Cut Size = 226

Pass 1
Best Partial Sum of Gains: 159
Total Sum of Gains (Should be 0): 0

Pass 2
Best Partial Sum of Gains: 25
Total Sum of Gains (Should be 0): 0

Pass 3
Best Partial Sum of Gains: 17
Total Sum of Gains (Should be 0): 0

Pass 4
Best Partial Sum of Gains: 16
Total Sum of Gains (Should be 0): 0

Pass 5
Best Partial Sum of Gains: 1
Total Sum of Gains (Should be 0): 0

Pass 6
Best Partial Sum of Gains: 2
Total Sum of Gains (Should be 0): 0

Final Cut Size = 6

FM Algorithm Run Time: 0 sec
Total Run Time: 0 sec

- **Verify Command**

Format: `./<exe> <nets file name> <cells file name> <output file name>`
E.g. `./verify ../testcases/p2-1.nets -n ../testcases/p2-1.nets ../output/p2-1.out`

- ✓ Output: (AC or not AC)