EE6094
CAD for VLSI Design

PA4
Analog Floorplan

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Outline

◆ Problem description
◆ Input format
◆ Output format
◆ Evaluation

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◆ **Problem description**

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Problem description

◆ Integral Nonlinearity (INL)

➢ A key metric that measures the deviation of a device's ideal linear response

➢ A widely distributed layout will result in a higher INL value

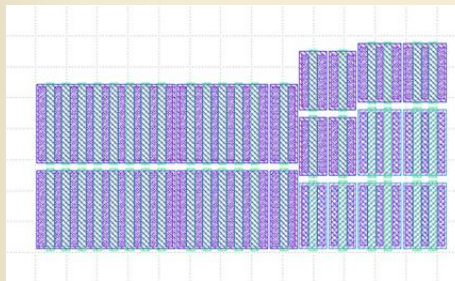2025/5/12　　　　　　Andy Yu-Guang Chen　　　　　　4

Problem description

◆ Integral Nonlinearity (INL)
  ➢ A key metric that measures the deviation of a device's ideal linear response
  ➢ A well-organized layout will result in a lower INL value

Problem description

◆ Place modules without overlap while minimizing the bounding box area and Integral Nonlinearity (INL).

◆ Input
  ➢ A set of rectangular modules(transistors)

◆ Output
  ➢ A legal floorplan result

◆ Objective
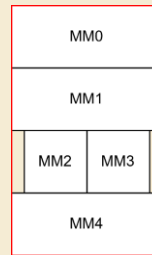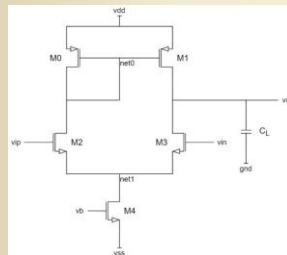 ➢ Minimize the bounding box area while considering Integral Nonlinearity

Problem description

◆Constraints
  ➢ The runtime of your program is limited to at most 10 minutes per testcase
◆Algorithm
  ➢ You can use any algorithm you want to solve this problem

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Input format

MM0 (4.99 2.12 4 1)
MM1 (4.99 2.12 4 1)
MM2 (1.9 4.74 1 1)
MM3 (1.9 4.74 1 1)
MM4 (1.9 22.16 1 4) (2.93 11.08 2 2) (4.99 5.54 4 1)

<device_name> (<width><height><col_multiple><row_multiple>)

Note :
<col_multiple> & <row_multiple> represent the number of
parallel instances in two dimensions

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Output format

```
72.4548
4.99 14.52
7.53
MM0 0.0 12.4 (4.99 2.12 4 1)
MM1 0.0 10.28 (4.99 2.12 4 1)
MM2 0.595 5.54 (1.9 4.74 1 1)
MM3 2.495 5.54 (1.9 4.74 1 1)
MM4 0.0 0.0 (4.99 5.54 4 1)
```


<chip area>
<chip width> <chip height>
<INL>
<device_name><x><y>(<width><height><col_multiple>
<row_multiple>)

Outline

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◆Input format
◆Output format
◆**Evaluation**

Evaluation

◆Correctness (30%)

◆Quality (10%)

◆Readability (10%)

◆The report (20%)

◆Demo session (30%)

Correctness

◆We will have 2 public cases and 3 hidden cases to judge your program

◆TA will test your program with your makefile:
  ➢make all
  ➢make run input=$input\_file$ output=$output\_file$
  ➢make clean

◆You will get the point if you correctly implement the algorithm and pass the checker for each case

Quality

◆ We will rank the cost and Integral nonlinear for each case to judge the quality of your project.

Readability

◆ Function cuts
◆ The name of the variables
◆ Typesetting

The report

◆In your report, you have to include at least:
- ➢Compilation and execution
- ➢Completion
- ➢Method of your design
- ➢Test cases results
- ➢Hardness
- ➢Suggestions

◆We don't restrict the report format and length

The report

◆You can also include
- ➢Cover
- ➢Flow charts
- ➢Code explanations
  - • Concepts, functions, variables, etc.

◆The grading of the report will compare yours with others

◆Remind the resolution of the figures

Demo session

◆ You must show up in the demo session, otherwise you will get 0 point of this PA

◆ Be familiar with your code

Q&A

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