

# Physical Design PA2 Report

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## ● Flow

- I. Parse input (start\_timing)
- II. Sort block list with their width
- III. Do initial placement
- IV. Simulation annealing
  - A. Set initial temperature and decay ratio
  - B. Random select B\*-tree perturbation:
    1. Rotate
    2. Delete and insert
    3. Swap two nodes
    4. Swap two trees
  - C. Calculate the cost of the new tree
  - D. If the cost is greater than the cost before, keep the change under certain chances
  - E. If the temperature is under 1 degree and heating times is under 5, reheat it

## ● Data structure

### I. B\*-tree

The B\*-tree can support four perturbations: rotate, delete and insert, swap two nodes, and swap two trees.

- A. To delete a node, I check if one of its children is empty, if so, delete the node directly and link its only child to its parent. If both of its children are not empty, swap the node with a randomly selected child until one of its children is empty.
- B. To insert a node, I randomly select a node position to check if one of its children is empty, if so, insert it directly, otherwise swap it with a randomly selected child.

### II. Contour

I used a double link list to store the contour.

- A. maxInRegion: this function will return the maximum height in the given region.
- B. updateContour: this function will update the contour in the given region.

## ● Findings

- I. To store a contour, I tried two types of data structures: Vector and link list. And I found that when I used a double link list to store the transition of the contour is much faster than a vector.

- Advanced Features

I use Gnuplot to plot my floorplan. The red line is the transition of the contour. And the yellow line is the contour height.

Ex. Ami49

