SPANNING TREE

- Route that connects all pins and is a tree
- Minimal spanning tree is a spanning tree of minimum length

RECTILINEAR SPANNING TREE

- Route that connects all pins and is a tree
- Only uses pin-to-pin connections
- Only use "RECTILINEAR" (MANHATTAN) routing

RECTILINEAR STEINER TREE

- Route that connects all pins and is a tree
- Uses pin-to-pin connections and Steiner points
- Introduction of Steiner points can reduce total wire length compared to the rectilinear minimal spanning tree

Finding min spanning tree is $O(p^2)$ using classic algo $p = \# \text{ pins}$

Finding min rect spanning tree is $O(p^2)$ using classic algo

Finding min rect Steiner tree is NP-hard

Need to use heuristic algorithms
Heuristic Sequential Steiner Tree Algorithm

1. Find closest pin pair (in terms of rectilinear distance)
   Construct MBB₀

2. Find closest pin (not part of the tree) to a point on MBB₀. Call closest pin not in the P₁ and closest on MBB₀ P₀.

3. Construct MBB₁ from P₀ and P₁.

4. Add L-shape to MBB₀ which includes P₀ to the tree (delete other L-shape)

5. Set MBB₀ = MBB₁

6. Goto Step 2

Steps: 1, 2, 3

Steps: 4, 5, 6, 2

Steps: 3, 4, 5, 6, 2

Steps: 7, 4, 5, 6, 2
seen: 3, 4, 5, 6

Solution: