Lab5 - Detailed routing project

Deadline: 23:59 Jan 18, 2022

Problem Statement

Implement a 2-layer detailed router to complete channel routing problems. You can use any rip-up and reroute based detailed router or greedy channel routing algorithm.

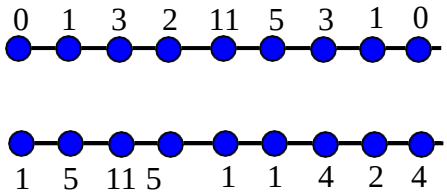
Input/Output Format

Input:

Input Example.

0 1 3 2 11 5 3 1 0

1 5 11 5 1 1 4 2 4



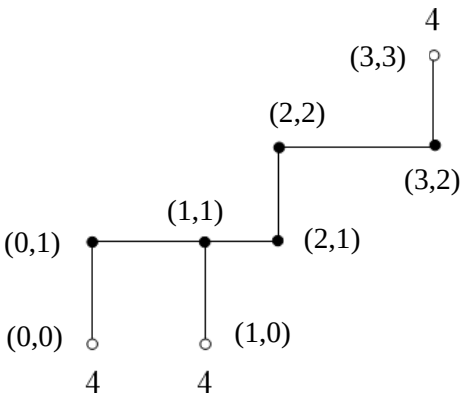
Three test cases, case1, case2, and Deutsch difficult are provided.

Output:

Text: print out all horizontal and vertical paths of every net in a file. Column's width and track's height is 1. Coordinate of bottom layer's first net is (0,0).

Format:

.begin net_name
.H lef_x lef_y rig_x
.I bot_x bot_ _y top_y
.end



Example. The above figure displays the routing of net 4 (three pins and 5 vias).

.begin 4

.H 0 1 2

.V 0 0 1

.V 1 0 1
.V 2 1 2
.H 2 2 3
.V 3 2 3
.end

Note that. There is no fixed wire segment order. A via is induced by the intersection of one horizontal and one vertical wire segment of the same net. If two wire segments of different nets with the same direction overlap, a short error occurs. You can use the verifier to examine the routing errors.

Graphic (optionally): You can draw the routing results on the screen to make debugging easier.

Executing Procedure

1. Compile (Please describe how to compile your file in readme)
2. **./Lab5 [input.txt] [output.txt]**
3. Search for [output.txt], if not found→ break → 0 point
4. **./ verifier [output.txt] [input.txt]**
5. If fail → break→ 0 point

Ranking

A. Can run small case but fail in Deutsch difficult (cannot generate routing result) – 60

B. Ranking is mainly based on the correctness of routing results and the required number of tracks to complete the routing of "Deutsch difficult.txt".

If the routing result of "Deutsch difficult.txt" is correct, ranking is categorized into following sets:

Maximum tracks	Minimum tracks	Base score
infinity	51	75
50	41	80
40	31	85
30	25	90
24	22	95
21	19	100

C. No spill-over area is allowed. (No extra columns off the edge.) If the routing results have spill-over area, you can get at most 50.

D. For each case, the run time limit is up to 300 seconds. It will be regarded as "failed" if you use more than 300 seconds.

E. Accept four days late submission, 10% deduction per day. That is, if you hand in on 1/19, the score will be *0.9; if you hand in on 1/22, the score will be *0.6, and submission will not be accepted after 1/22.

Submission

Please submit the following materials in a .zip file to E3 by the deadline, specifying your student ID in the subject field (e.g., StudentID.zip):

(1) Source codes (.cpp, .h …)
(2) Makefile
(3) Executable binaries (Lab5)

A text readme file (readme.txt), stating how to build and use your programs.