Exercises for Grid Routing

- Suppose that $n$ nets, numbered $1, 2, \cdots, n$ are to be routed one after another using a maze router. Which of the following strategies do you think will be most successful in completely routing all the nets?

  1. Route the nets randomly.
  2. Sort the nets in the descending order of their length, i.e., longest net first.
  3. Sort the nets in the ascending order of their length, i.e., shortest net first.

- Continuing the above exercise, give an example where the longest net first strategy succeeds but the shortest net first strategy fails.

- What is the percentage saving in memory when the conventional filling sequence as proposed by Lee is modified to the sequence $1 - 1 - 2 - 2 - 1 - 2 - 2 - \cdots$? Assume that the layout contains 100 cells each of size $8 \times 8$ grid units and the average routing area is twice the area occupied by the cells. Clearly state any assumptions made.

- Fill the grid in the following figure using the technique suggested by Hadlock for the minimum detour router.
Consider the maze shown in the following figure. There are 5 two-point nets to be routed. The nets are numbered 1, 2, · · ·, 5. Assume that a single layer is available for routing. Suppose that the maze router is used to route the nets in the order 1, 2, 3, 4, 5. Is it possible to complete the routing? Assume that the router visits adjacent cells in the order W, E, N, S. In what order should the nets be routed to complete the routing using the maze router?