**Warnsdorff algorithm:**

In this approach we can start from any initial square on the chess board. Then, we will move to an adjacent, unvisited square with minimum unvisited adjacent squares.

* a heuristic for finding a single knight's tour.

Basically, the knight is moved so that it always proceeds to the square from which the knight will have the fewest onward moves.

**Warnsdorff Rule:**

* We can start from any initial position of the knight on the board where it has the least accessibility.
* We always move to an adjacent, unvisited square with minimal degree (minimum number of unvisited adjacent squares).
* This algorithm may also more generally be applied to any graph.

**Define:**

A position Q is accessible from a position P if P can move to Q by a single Knight’s move, and Q has not yet been visited. The accessibility of a position P is the number of positions accessible from P.

**Algo:**

1. Set P to be a random initial position on the board from among the four corners.
2. Mark the board at P with the move number "1".
3. We’ll do a set of steps for each move number from 2 to the number of squares on the board.
   * First S will be the set of positions accessible from P.
   * Set P to be the position in S with minimum accessibility.
   * Mark the board at P with the current move number.
4. Return the marked board - each square will be marked with the move number on which it is visited.

**Time complexity:**

Warnsdorff’s rule finds a tour in linear time. The time complexity of this heuristic is O (N × N) where N is the dimension of the chessboard.

* The algorithm produces a successful tour over 85% of the time on most boards with N less than 50, and it succeeds over 50% of the time on most boards with N less than 100.
* However, for N > 200 the success rate is less than 5 %, and for N > 325 there were no successes at all.
* So, these observations suggest that the success rate of Warnsdorff random algorithm rapidly goes to 0 as m increases. This can also be seen in the given graph.