

Report

Method - Nearest Neighbor	Length of Tour	Time taken (in seconds)	Optimal tour (From website)	Solution Time (From website)
Djibouti - 38 Cities	9745	0.000643 s	6656	0.24 seconds
Luxembourg - 980 Cities	14370	0.032036 s	11340	1681.68 seconds
Canada - 4,663 Cities	1646884	0.806833 s	1290319	560,951 seconds
Greece - 9,882 Cities	388944	4.51777 s	300,899	7.9 million seconds

Nearest Neighbor algorithms - Starting from node 1, find the nearest node and visit it. Then find the nearest node to the current node and visit it, and repeat until all nodes have been visited.

The Nearest Neighbor algorithms consistently provide tour distances approximately 25-30% above optimal values for larger sample sizes, with variations increasing up to 35-40% for some smaller datasets.

Despite the variation, the Nearest Neighbor algorithms might not guarantee the optimal tour but the time taken to form a tour using the nearest neighbor algorithms is significantly faster.

While optimal tours are not guaranteed, It has shown that the algorithm exhibits scalability, with the time taken steadily increasing from smaller to larger inputs.