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Programming Assignment 6

Traveling Salesperson Problem with a Stack - Shortest Path Tree.

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Problem

Traveling Salesperson Problem with a Stack to figure out the shortest path.

Algorithm

The algorithm used was a non-recursive algorithm that uses stacks to solve the problem.

Program Design

There are 2 methods besides the main method and a constructor and some global variables that hold this program together. The most important method is for the algorithm which creates a way for the program to find the shortest path. Other than that there's a populate method which fills the array with the data provided and outputs it.

Results

0 5 3 8 4 1 11 6 7 10 9 2 -tsp12 Best path

It took 31 milliseconds

0 5 3 8 4 1 11 6 7 10 9 2 12 -tsp13 Best path

It took 31 milliseconds

0 5 3 8 4 1 13 11 6 7 10 9 2 12 -tsp14 Best path

It took 40 milliseconds

0 5 3 8 4 1 13 14 12 2 9 10 7 6 11 -tsp15 Best path

It took 38 milliseconds

0 5 11 8 4 1 9 3 14 13 10 15 12
7 6 2 -tsp16 Best path

It took 30 milliseconds

0 5 11 8 4 1 9 3 14 18 15 12 7
6 10 13 17 16 2 -tsp12 Best path

It took 43 milliseconds

0 27 5 11 8 4 20 1 19 9 3 14 18
24 6 22 26 23 7 15 12 17 13 21 16
10 28 25 2 -tsp12 Best path

It took 54 milliseconds

Observations

This algorithm was much more efficient than the in lab 5. It found the results much more quickly than the old inefficient algorithm. Whereas the old algorithm would take many minutes to find the results as the cities started increasing this algorithm finds the shortest path even in 29 cities in a matter of seconds