

Final Project Graphs

The data set and project idea :

This data set is called the Road Network of California([link](#)) from Stanford University Large Network Dataset Collection. The Intersections and endpoints are represented by nodes and the roads connecting these intersections or road endpoints are represented by undirected edges. From my research I understood that Google Maps and Apple Maps use breath for search as well to give us the shortest path to a destination. This is not more complicated with traffic data and what not. Many robotics companies use this for indoor navigation as well for robots to deliver materials from one end of a production line to another. I wanted to explore how these systems worked using Breath for Search (BFS).

Project Execution :

This project selects two nodes. One as a starting point for the navigation and one as the final destination. The data is arranged in a Hash Map. It uses the neighbors to identify where to go next in order to find a path. I chose node 4 as the origin and node 30 as the destination. Since there is only one route that is needed the function visits a node in one direction and digs deeper until it finds the final destination node. Every node and edge it goes through is marked as explored to keep a tally. It finally reverses the values to give us a readable path from origin to destination. The results I got were (4 5 6 1 385 386 387 139 133 93 94 77 17 3254 3255 29 30).

If I get a chance to build on this project I would like to add toll prices for each route and encourage the program to find the cheapest and shortest route at the same time.