BRIEF REITERATION OF GOALS:

To briefly outline what this project was meant to do — the goal was to implement DFS, landmark path and strongly connected components to analyze how the California road network graph was connected. The algorithms can also be applied to any unweighted and undirected graph in the same file format.

RESULTS:

The project has successfully implemented all of the aforementioned algorithms, and they run without issue on our dataset. They will additionally work on any dataset in the same format. We have also implemented tests for the functionality of each algorithm.

This project has leveraged data structures and algorithms for a tangible real-world use case. Using our project, one can gain insight into how well connected the California road network is (or any other unweighted, undirected network for that matter). DFS will allow someone to quickly ascertain whether roads connect them to a final destination. Shortest path will help find the most efficient possible series of roads that will get them there. Landmark path allows a user to make efficient detours. Connected component and strongly connected component help users find large clusters of roads that are possible to navigate, and whether the entire series of roads and destinations are all connected.

The project has also taught us a lot, both within and outside of academic computer science. We learned how to better take advantage of data structures such as queues, vectors and sets in order to accomplish our goals. We also learned to be mindful of efficiency - turning what was initially a series of connected Node objects into an adjacency matrix in order to make our code run far more efficiently while accomplishing all the same goals.

We also learned how to best take advantage of an iterative design methodology and test-driven development; making incremental changes to our project and quickly conferring with the rest of the team in order to reach a working project that simultaneously satisfied all team members by ensuring everyone's voice was heard and respected. Everything that was initially written within our team contract was held by all members, and that was a key contributing factor in making this project work.