**Team Name:**

Make Agile Great Again

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**Big O and Data Structures**

The shortest trip algorithm runs in O(n4). To prove this, we analyzed the recursive algorithm. Firstly, it creates a list of visited campuses. The worst case scenario is O(n). Then, it checks if the ending campuses is a part of the trip, which has a O(n). Within the prior loop, it iterates through a list of ending campuses and distances from the database, this runs n amount of times. Inside of this loop, it verifies if the ending campus is not in the list of visited campuses by iteration, which has a O(n). These nested loops results in O(n3). Next, it iterates to find the destination college, which has O(n) run time. Also, it checks if all colleges have been visited, which also runs in O(n). Finally, the shortest trip algorithm is recursively called. Since there are three instances of O(n), this results in O(3n). Recursion adds one to the exponent of both O(n) and (n3), which results in O(3n2) + O(n4). Since O(n4) is significantly larger than O(3n2), the big O run time of the entire algorithm is O(n4).

The data structures used in this project consists of stacks, queues, and vectors.