# C950 WGUPS Algorithm Overview

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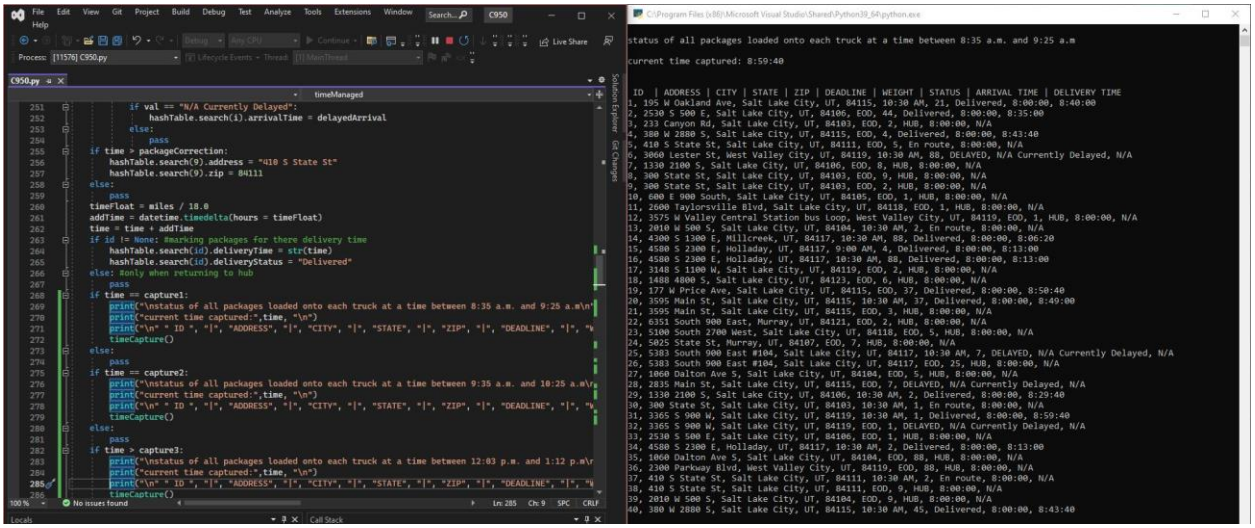
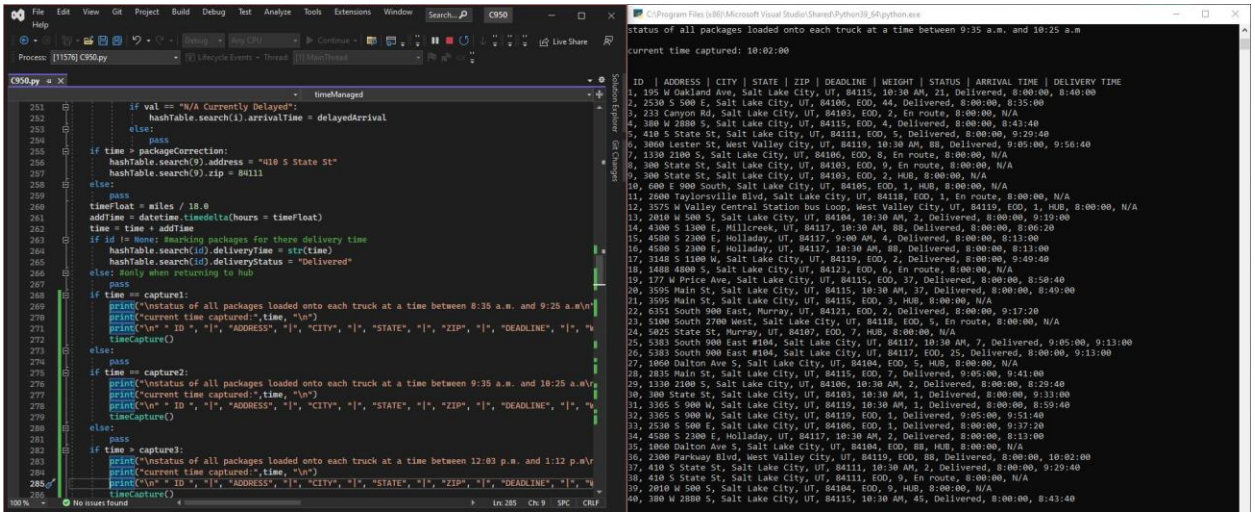
9/11/2023

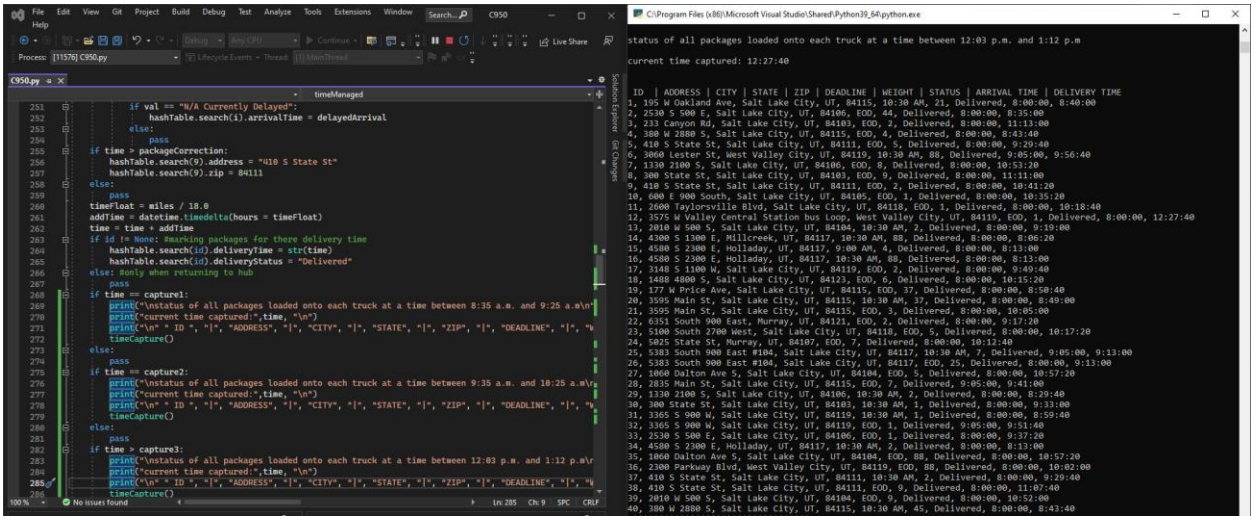
C950 Data Structures and Algorithms II

Task 2 Written Section

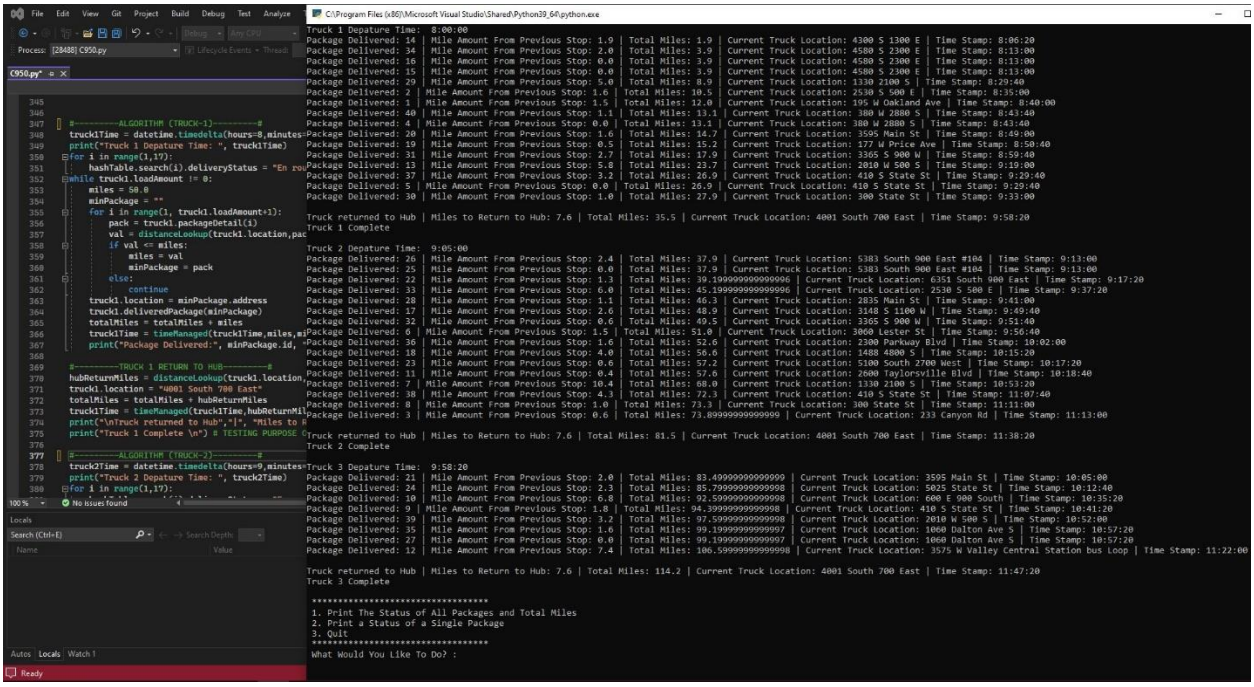
## D. Time Frame Screenshots







## E. Total Milage Screenshots




## F.1

The algorithm to determine the 3 trucks is the nearest neighbor algorithm. One strength of this algorithm is that it will always churn out the lowest possible next package to help keep the miles low. The second strength of this algorithm is its scalability. This algorithm can take in any number of packages and determine the lowest mileage value. However, due to restrictions in the project, this one's max is 16.

## F.3

Two other algorithms that could be used, are linear search and a binary tree. These differ in many ways. Linear search is going to require going through every single package one by one, every time you try to search for it, which would be slower than a hash table (Lysecky & Vahid, 2018). The binary tree could be done a couple of ways, hypothetically you could make the root the hub and then trickle down the tree to the closer address (something like the nearest neighbor), however, I believe a binary tree, in this scenario, going to require a lot of workarounds to get working correctly. Both algorithms could work for all requirements, they would all require different lengths and workarounds in code.

## G.

There are a few things I would do differently, Firstly, I would not load the whole package object into the truck, I would load just the package ID, this caused some headaches in the code that had some kinks I had to work around. I would also probably optimize more and future-proof the code. The code itself works and is relatively quick, however not understand the project to its full at the beginning, there is some optimization and future code that would have been beneficial.

## H. 1

You could use a traditional dictionary, and you could also use a traditional array.

## H.1.a Strengths of Chosen Algorithm

A traditional dictionary is not much different than the hash table we used. However, the way we did the hash table, we can manipulate it. Using a standard dictionary would have left the "under the hood" code up to Python and the translator. An array would not have returned the value from using a key, instead in the code I would have had to directly ask for the object in the array instead of using a key to find it and return the value.

## I. Sources - Works Cited

Lysecky, R., & Vahid, F. (2018, June). *C950: Data Structures and Algorithms II*. zyBooks.

Retrieved March 22, 2021, from

https://learn.zybooks.com/zybook/WGUC950AY20182019/