C950 Task-1 WGUPS Algorithm Overview

(Task-1: The planning phase of the WGUPS Routing Program)

Alexander Fair

ID # 001574781

WGU Email: afair26@wgu.edu

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C950 Data Structures and Algorithms II

# Introduction

The purpose of this assignment is to create a program that will use algorithms to route 3 trucks with 2 drivers to deliver 40 packages while staying under a total of 140 miles traveled for 2 of the trucks.

# A. Algorithm Identification

Nearest Neighbor Algorithm

# B. Data Structure Identification

For the package list, create a hash table where the key is the package ID and the package info is stored in the buckets.

For the address list, create a dictionary where the key is an address identifier (unique address ID number) and the value is the full address details.

For the distance table, create a dictionary where each key is a tuple of address identifiers representing a pair of addresses, and the value is the distance between them.

# B1. Explanation of Data Structure

The hash table provides constant time complexity *O*(1), for search insert and delete operations on average, which is crucial for quickly accessing package details based off their ID’s during the routing process. Hash tables also have well-defined methods for handling collisions ensuring that even in the cases of key conflicts, package data remains accessible and distinct. Hash tables also allow for flexible handling of package data, including addresses, delivery deadlines, delivery status, and weight. The flexibility is essential for dynamically updating package statuses or requirements as routing decisions are made.

# C1. Algorithm’s Logic

Find package closest to hub,

Pseudocode goes here

# C2. Development Environment

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# C3. Space and Time complexity using Big-O notation

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# C4. Scalability and Adaptability

Text goes here

# C5. Software Efficiency and Maintainability

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# C6. Self-Adjusting Data Structures

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# C7. Data Key

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# D. Sources

Text goes here

An example:

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

Retrieved March 22, 2021, from <https://learn.zybooks.com/zybook/WGUC950AY20182019/>

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