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DATA STRUCTURES AND ALGORITHMS II — C950

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Algorithm Overview:

The Greedy algorithm I created works in the following manner:

1. Run while the truck still has packages
2. Retrieve either the priority packages or regular packages list from the truck.
3. Compare all of the package distances to determine the one with the shortest distance
4. Drive to the closest address and deliver the package.
5. When all packages delivered, return back to the Hub

Because of the fact that the trucks can only hold 16 packages, this algorithm will never creep out of the $O(n^2)$ range. However, the step where all of the packages are compared is costly as it has to be performed for every iteration of the outermost while loop. Therefore, as the scope of the project stands the runtime for this algorithm will always be $O(n^2)$, constrained by the number of packages the truck can hold.

Pseudocode:

```
while truck still has packages:
    package_list retrieved from retrieve_packages_function()
    set smallest_distance to very high integer value
    set the closest_package to null
    for package in the package_list:
        distance_value retrieved from the Address Graph between Trucks address and the packages
        if the distance value is smaller than smallest_distance:
            set smallest_distance to distance
            set closest_package to package
    Truck will drive to closest address and deliver package
once loop is over, truck will return to hub

retrieve_packages_function():
    if the trucks priority list has any packages:
```

```
        return priority_list
    else:
        return regular_package_list
```