Narrative- 2: Data Structures and Algorithms

In this update my goal was to improve upon the data structure and algorithm for extracting the train departure times. The original data structure for containing the train station information was a simple list and each piece of information was in its own index in sequential order. For example, the train station came first followed by the corresponding station id then the coordinates of that station each piece of information in its own index.

Example: [station name, station id, [latitude, longitude]]



In the updated data structure, I have enclosed each station and its corresponding data into a tuple. Now I have a list of tuples. This makes more sense and adds security to the data.



Using the new data structure, the algorithm becomes a little simpler; Instead of using a range to iterate through the list I can use a for each loop which manages itself.

The figure below shows the old algorithm for calculating the distances using the list. You will notice the inclusion of a range base loop, the modulus operator and if-else statements.



In the new algorithm which uses the list or tuples I was able to get rid of the if-else statements, the modulo, and the range base loop which simplified the algorithm to calculate the distance.



In addition to the above modifications, I added the algorithm to get the departure times for the trains going north and south. Instead of displaying the next two departure times automatically, I have improved the algorithm to display the next 4 departure times which should give the user a better range of times since during rush hour there are multiple trains leaving every hour; outside of rush hour trains depart one every hour.





The new data structure showcases my ability to use/unpack more complex lists; in this case a list of tuples which contained a list of coordinates.

Reflection:

I decided to change the list data structure to a more complex data structure for readability, it also made the processing algorithm simpler; It simply made more sense to encapsulate each station information inside its own data object. I also change the algorithm that finds and displays to available departure times from two to four departures going north bound and south bound; I did this because I noticed than more trains leave during rush hours than none-rush hours.