Kieyn Parks

SNHU

CS-499

Milestone 2

**A. Briefly describe the artifact. What is it? When was it created?**

The project I am working on is a brand new project from scratch for this course, it will simply return the closest 2 train stations if they are both within 5 miles of the user, otherwise it will return the closest station plus the next 3 departure times in both directions will be displayed to the user; this happens automatically because the primary use case will be the type of user that just needs to know the next departure times. If the train station is a major hub of which there are only a handful then more information will be required from the user (destination address e.g town or zip code). The aforementioned use case is the first feature. The second use case will be the trip planning use case. In the trip planning feature the user will be able to plan trips that require knowing all times of departure from any station and any connections that must be made to complete the trip. The goal of the app is to be as automated as possible requiring very little interaction from the user while remaining intuitive and responsive.

**B. Justify the inclusion of the artifact in your ePortfolio. Why did you select this item? What specific components of the artifact showcase your skills and abilities in software development? How was the artifact improved?**

This project covers all the components required by the class.

* Engineering and design
  + Flow charts
  + Use case diagrams
* Database
  + NoSQL (mongodb)
  + Use of index searches (binary search)
* Algorithm
  + Linear search
  + Binary search
* Data Mining
  + Web scraping (beautiful soup)
* Voice command (tentative time permitting)

This project is a real-world solution to a real-world problem being developed from scrap.

**C. Did you meet the course objectives you planned to meet with this enhancement in Module One? Do you have any updates to your outcome-coverage plans?**

In this project I was able to cover all the requirements of the course database, design, algorithms and data mining which is outside the scope of the requirements but was an important part of my project.

The project remains a work in progress and would be completed in increments according to my feature list. Improvements will be made as follows (not necessarily in the provided order):

Database Management System (CRUD):

1. Insert document
2. Search document
3. Update document
4. Delete document

User Interface feature 1: Closest station

1. Get distances to closest train station.
2. Get departure times for closest train station
3. Display station and departure info to user

User Interface feature 2: Trip planning

1. Get departure times for all stations
2. Collect trip details from uses
3. Cross reference stations with train lines
4. Display route and time information to user.

User Interface feature 3: Voice inputs (Tentative, subject to time)

**D. Reflect on the process of enhancing and/or modifying the artifact. What did you learn as you were creating it and improving it? What challenges did you face?**

The user application is optimized to be used on a mobile device. The choice to prototype the application in python is because of my familiarity with the language and functions. I intend to eventually migrate this project to a mobile device in a native language at a later date.

Much of the concepts in the project design, database and algorithms are not new to me but I had to do some revision to get the features working. For example, I had to revise NoSQL MongoDb database remote connection and management. I also had to research how to calculate distances using decimal latitude and longitude using the “haversine function” which is calculated in radians (all input values must be converted to rads).

The biggest challenge I have faced so far is developing an algorithm to parse the time values to be able to make a comparison between local time and train departure times; some values are in string format which had to be converted to integer before the comparison could be made. The values are not all consistent some may have slight variations which has to be accounted for.