Project Design Baadshah Verma
November 2nd, 2018

**def getAllStationData():**

“Function will read in a data file 'bikes.txt' from the internet and the data will be stored in a nested dictionary. The key will be the station ID and the values will be the rest of the values. It will return this nested dictionary for use in other functions.”

**def getUserRequirements():**

“Function asks the user what they would like to do before proceeding. (4 options)

1. Would you like to get all info about a station?

2. Is there a bike available at a particular station and if so, how many bikes are available? (If they are available, would you like to rent? If not available, provide directions and then rent)

3. List all stations that have bikes available (sort by station with most number of bikes to least) and asks which station user would like to rent from

4. Would you like to see which stations are not filled to capacity? and asks which station user would like to return a bike to

Depending on user input, the program would call its respective functions to get that request completed. This would return the number that the user chooses (what they would like to do) as an int'''

**def retrieveStationID():**

“This function will ask the user for the station ID that they want to rent/return from. It will return the station ID as a int value.”

**def specificStationData(getAllStationData, retrieveStationID):**

“This function passes parameters getAllStationData (nested dictionary of all data) and retrieveStationID (retrieves stationID user would like to find info about). Using these parameters, the function prints all information about that specific station.”

**def trackRentals(getAllStationData, retrieveStationID):**

“This function will take in a parameter getAllStationData and retrieveStationID. Using this information, the function will select the bikes available value in the dictionary and subtract by 1 since a bike has been rented and add 1 to docks available. This function will return the updated dictionary.”

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**def trackReturns(getAllStationData, retrieveStationID):**

"This function will take in a parameter getAllStationData and retrieveStationID. Using this information, the function will select the bikes available in the dictionary and add 1 since a bike has been returned and subtract 1 to docks available. This function will return the updated dictionary."

**def checkAvailability(retrieveStationID, getAllStationData):**

"This function takes the stationID and checks if there is a bike available at that station. This returns the number of bikes available and prints the number so that the user can see."

**def getNewLocation(getAllStationData, retrieveStationID):**
"This function will find the nearest location to retrieveStationID that has a bike available**.** It will use the latitude/longitude to calculate the direction that the user must go in. This will print both the directions to the station and the stationID and returns the stationID."

**def bikesAvailable(getAllStationData):**
"This function will list all stations that have bikes available, sorted by the station with the most bikes available to the least. This will print a list of the stations and the amount of bikes available."

**def openStations(getAllStationData):**
"This function will list all stations that have open docks, sorted by the station with most docks available to the least. This will print a list of the stations and the amount of docks open."

**def main():**

Call the getAllStationData function inside of a variable to get access to the file. Also call the getUserRequirements() function to get info about what the user wants to do. This will ask the user to enter a value: 1, 2, 3, 4. Depending on the value, there will be a loop in the main function with the following if statements for each value:

"if value = 1: this will call the retrieveStationID function inside of a variable to get access to the stationID. Pass this stationID through the specificStationData() function to retrieve all information about that station. This simply calls the required functions to print out the information about a specific station - fulfilling the users request for a value of 1."

"if the value = 2, this will call checkAvailability function to show the number of bikes available. In this function, an input function will ask user if they would like to rent a bike or not (if the number of bikes avail > 0). If yes then call trackRentals which will account for the rental. If there is no bikes available at this location, the program will call getNewlocation which will give

directions to the nearest station that has bikes available. After getNewlocation, call trackRentals to account for this rental from the new station."

"if the value = 3, bikesAvailable will be called to show the stations that have bikes available. After this, the user will be asked if they would like to rent from any these stations. Then call retrieveStationID which will ask the user which station they'd like to rent from and then call trackRentals, to account for this rental. (I can add in a line prompting user to pick station from the list if they choose an invalid station)"

"if the value = 4, openStations will be called to show the stations that have bikes available. After this, the user will be asked if they would like to return at any of these locations. Then call retrieveStationID which will ask the user which station they'd like to return at and then call trackReturns, to account for this return. (I can add in a line prompting user to pick a station from the list if they choose an invalid station)"

**Assumptions:**
-For each function, I have called the parameters the same name as the functions but in my program I will change the names to the appropriate values required rather than calling the function as a parameter

-Assume that when directions are given, the user is going to go the location so the rental is accounted for right then.

**User Interface:**

The user interface will be text-based, starting off with the getUserRequirements function, which will ask the user 4 main options which are listed in the function description. Depending on the option that the user chooses, there are user inputs and different values that are printed within each respective function.