

ECE 508 Final Project

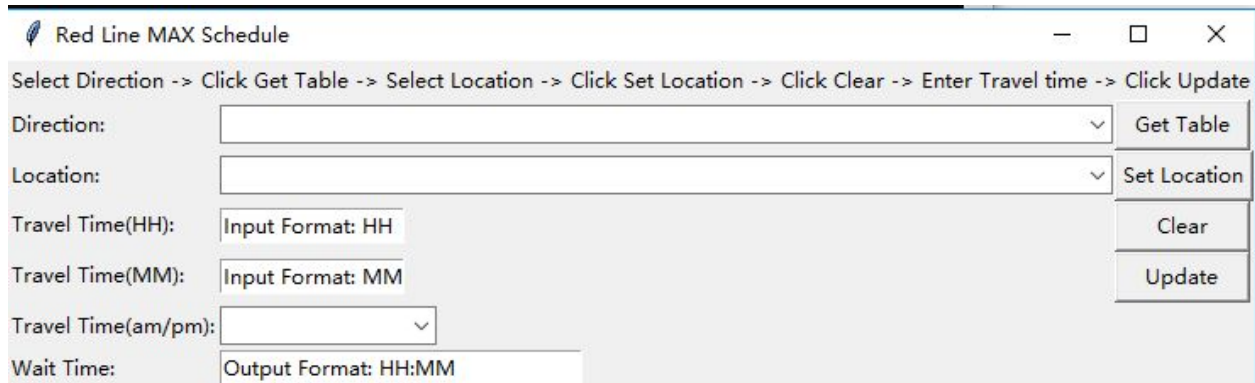
TriMet Red Line Train Schedule Check Tool

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Introduction

For this project, we want to develop a GUI which can be used to calculate the wait time if the user wants to ride TriMet red line train. We want to do this because finding the specific schedule of the red line train will take some time and the process is not obvious. Finally, our GUI can read the schedule of the max red line train(6 webpages) and users will choose the direction of the red line and the location where they want to ride the train. Also, they will enter the time when they want to take the train. Then, nearest 3 wait times will be calculated based on the information read from Trimet websites. We spent about 20 hours to finish this project. Basic ideas of this project is simple, but lots of details need to be handled properly.

GUI and How To Run



As shown above, this is our GUI. The first line of the label is the title of our GUI and the second label is the process to use this GUI. The users need to choose Direction first, then click **Get Table** button. This step will choose which webpage to read from the TriMet website and read the useful information to our GUI. Then, users need to choose location and then click **Set Location** button. This will get the specific schedule of the red line train in that specific location. Also, this information will print in the terminal also just in case that users don't want to do the following steps. Next, there are some hints about input format and output format shown in the boxes. Users can take a look at them

and then click **Clear** button to enter the travel time. However, one thing need to notice the format of the input(12 hours). For example, you can enter 5:30am or 11:10pm. After entering the travel time, users need to click **Update** button to get the at most 3 wait time which are calculated by our GUI. If users want to change the travel time, you can just click **Clear** button and re-enter the new travel time and click **Update**. You don't need to do the first two steps if you don't change the direction of the train and the location. Also, the format of wait time is HH:MM. For example, 0:15 means 15 minutes.

Basic Descriptions of Our Code

For this project, we use several libraries such as **requests**, **bs4**, **tkinter** and **datetime**. The request library is used to set the link to the target HTML webpage. Bs4 is used to get the information from the HTML and then we can use some bs4 API to obtain the necessary information. Tkinter is used draw our GUI and datetime is used to calculate the time difference: wait time. More details can be found from our comments in our code.

get_train_info(station_info, time_info): This function will generate a dictionary which contains the information of the time schedules of different stations.

convert24(Intime): This function will convert the time format from 12am/pm to 24 hours. We found this function from websites and make some small change to that.

get_table(): This function is executed when user presses Get Table Button. Based on the user's choice, this function will generate a dictionary which contains the station information and its relevant time schedule.

set_curt_location(): This function is executed when user presses the Set Location Button. This will return a list which contains the time schedule of the selected station.

update_info(): This function is executed when user presses the Update Button. It will get the input time from user and calculate the nearest 3 wait time.

calculate_time_diff(departure_time, train_time): Calculate the time difference between the available train time and user input time.

clear_windows(): This function will execute when user presses Clear Button. So, user can enter travel time multiple times.

Challenges and Future Work

The biggest challenge for this project is how to get useful information from TriMet webpages(web scraping). After we do some researches and watch some tutorials, we found BeautifulSoup is a good tool to help us to achieve this. Moreover, the time read from Trimets websites is in format of 12 hours. So, we need to convert to 24 hours and convert to datetime object to calculate the time difference. Also, the red line train will become blue line train in late time when red line pass some specific stations. So, there are some 'X' attached in the schedule time. For this project, we just neglect this situation and delete the 'X'. If we have more time, we will consider this situation and add blue, green, orange line trains into our project.

Reference:

1. <https://www.geeksforgeeks.org/python-program-convert-time-12-hour-24-hour-format/>