**Project- Part(A)**

# **Using Pythons gtfs\_functions Package for transit stop and line frequencies and discussion of bus speeds using keplerGl on a map from GTFS data.**

GOAL:

An Introduction to Python package called gtfs\_functions which is helpful in faster GTFS spatial Analysis.

In this project, a map is created which shows the line frequencies from GTFS data for the city of San Francisco, California. The data is procured from SFTMA, a body for transport in San Francisco.

STEPS:

1. **Read the GTFS** files into Pandas DataFrames and GeoPandas GeoDataFrames
2. **Calculate frequency per line, frequency per stop**
3. **Show each of the above on a map by a variable**
4. **Export to spatial file either ESRI shape file or GeoJson.**

**DATA SOURCE: https://www.sfmta.com/reports/gtfs-transit-data**

**METHODOLOGY:**

**1. Install packages: gtfs\_functions, Geopandas and read the GTFS datasets. Code screenshots seen below. The corresponding routes, stops, stop times, routes and shapes can be exported from the GTFS data.**

**Routes:**

**Rou**Graphical user interface, text

Description automatically generated

**Stops:** Graphical user interface, application

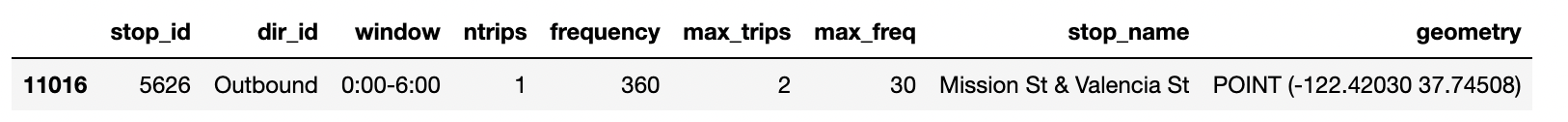
Description automatically generated

**Stop times, trips and shapes:**

Graphical user interface, text, application, email

Description automatically generatedMarked in black circles show geometry which can later be visualized on a map due to Geodataframes.

**2. Stop frequencies, line frequencies data for single headers.**

Stop frequencies: 

Line frequencies:

Table

Description automatically generated

Similar procedure can be followed for bus segments, bus speeds, segment frequencies with the GTFS data. All the above-mentioned variables will now be visualized on a map.

**3. Mapping the Calculated Variables.**

a. Line Frequency

Diagram

Description automatically generated with medium confidence

Diagram

Description automatically generated with medium confidence

b. stop frequency

The lines of code are similar except the step frequency variable is used.

Chart, bubble chart

Description automatically generated

4. The maps can be exported as shape files or Geojson to visualize further in GIS software

**CONCLUSION:**

The function called in this project are a part of powerful python packages that make it easy to parse and visualize GTFS data. For example, gtfs\_functions rely on Partridge that is very useful for GTFS. map\_gdf() and save\_gdf() are built on folium, another powerful python package. Other packaged used are Geopandas, pandas, branca, jenkspy and seen in the screenshot below.

Graphical user interface, text, application

Description automatically generated

**Discussion:**

Ubers kepler gl can be used also to map the schedules speeds in a particular segment and would be part B of this project. To add on, histograms, heatmaps, line charts, can also be shown in the interactive project if needed