Mini-Project 1

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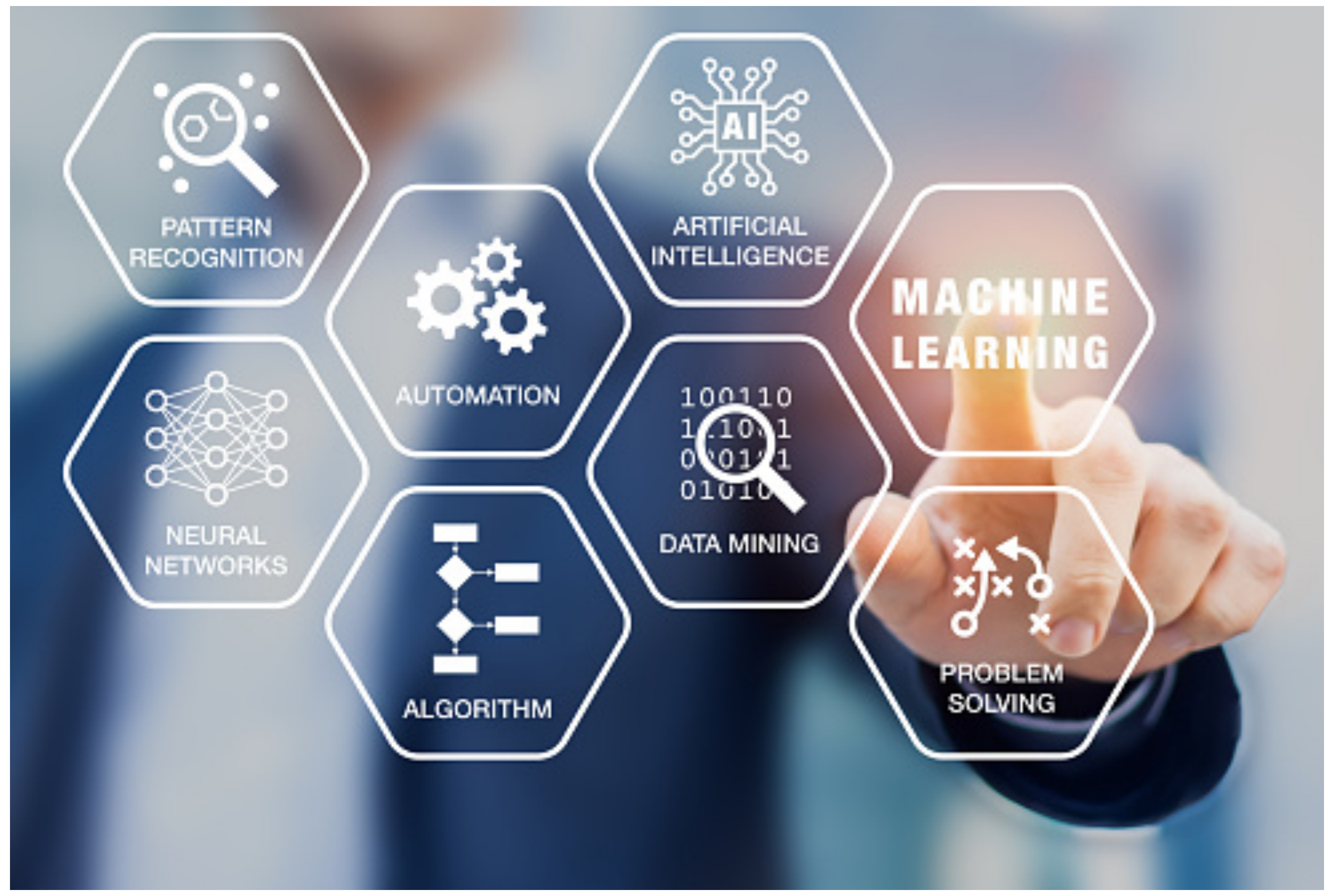
Introduction

- BCOMP, Computer Science - University of Guelph.
- BCOMM, Accounting - University of Guelph.
- Fintech Professional - Hedge Fund Accounting, Stock Market Indicies & Portfolio Optimization.
- Interested in Machine Learning, Data Science, Autonomous Vehicles & Blockchain.



Motivation

- To become more comfortable with Jupyter Notebook.
- To get comfortable with setting up API keys.
- Using data points to tell a story.
- Learning to read API documentation.
- Learning to extract important values to answer a specific question or business case.

Transport for London Unified API

Register

To use the Unified API, developers should register for an Application ID and Key. Append the `app_id` and `app_key` query parameters to your requests.

The public TfL data (or 'open data') released here is for open data users to use in their own software and services. We encourage software developers to use this data to present customer travel information in innovative ways - providing they adhere to the transport dat

Browse

You can browse and experiment with our REST API in Swagger UI, or build it yourself from the Swagger file.

AccidentStats AirQuality BikePoint Journey Line Mode Occupancy Place Road Search StopPoint Vehicle

Task

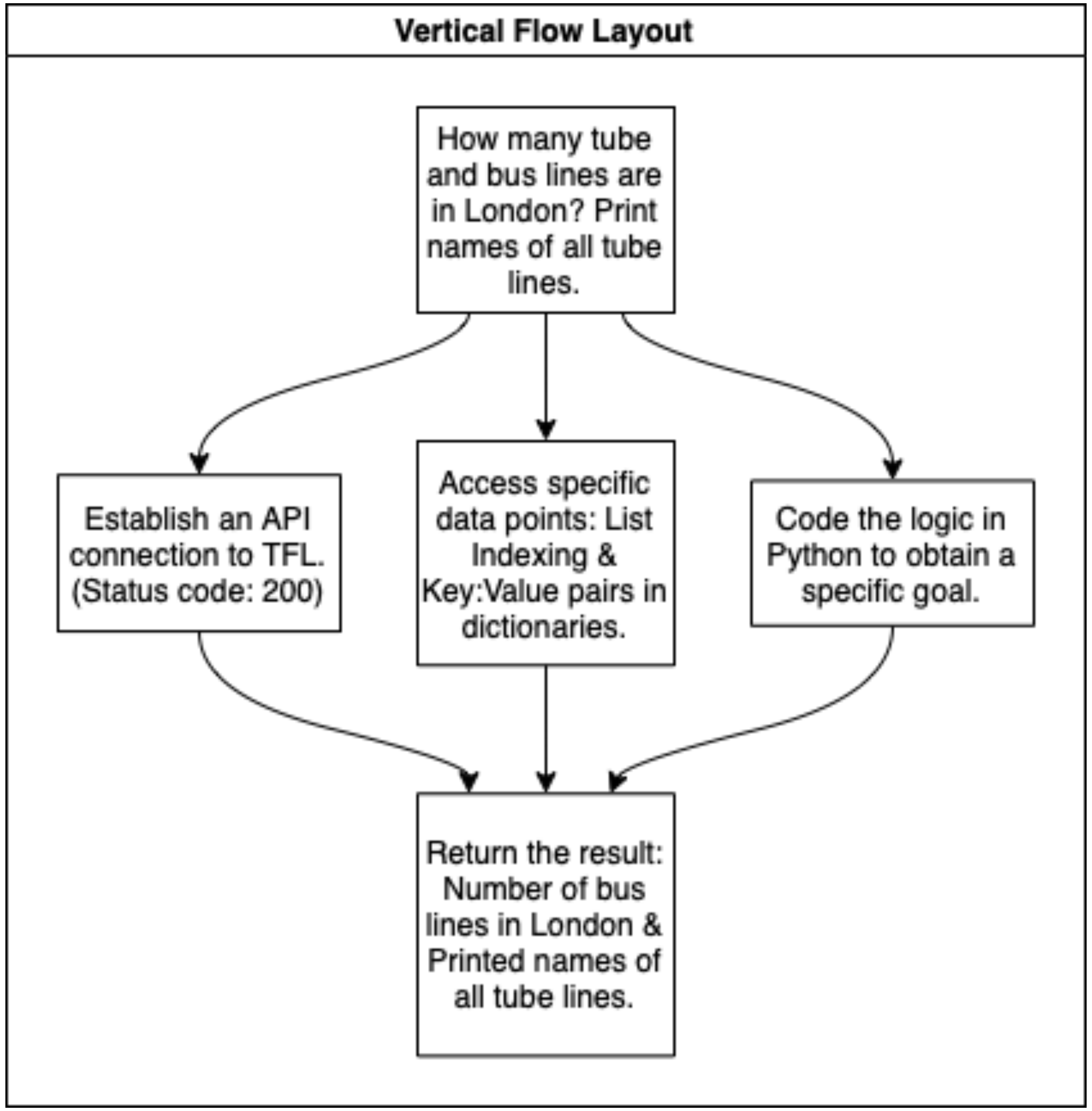
- To answer several questions surrounding the TFL API.
- It involves data manipulation to reach a specific goal or answer.
- Techniques used include:
  - Parsing dictionaries and strings
  - Nested IF statements
  - String operations specifically when printing
  - Accessing nested dictionaries
  - Setting up flags in control flow

```
air_quality_predictions_tomm = specific_air_quality(api_list_test)
print(air_quality_predictions_tomm)
```

```
Fine and settled, with some sunshine by day but with overnight frosts and stubborn fog patches readily developing, and perhaps staying for lengthy periods in some areas and suppressi
ng temperatures. Very little wind expected.These settled, still and foggy conditions could lead to a build up of local pollutants with Moderate levels of Particulates and possibly Ni
trogen Dioxide being reached at some busy roadside and industrial locations. Overall, air pollution is expected to remain  throughout the forecast period for the following pollutants
:Sulphur Dioxide
```

Modelling

Example: How many tube and bus lines are in London?
Print names of all tube lines.



Results

How many tube and bus lines are in London? Print names of all tube lines.

```
[251]: tubeBus_url= 'https://api.tfl.gov.uk/Line/Route?Regular'
tubeBus_response = re.get(tubeBus_url+url_append)
tubeBus_response.status_code
```

```
[251]: 200
```

```
[124]: tubeBus_response.json()[0]['routeSections'][0]
```


```
[124]: {'$type': 'Tfl.Api.Presentation.Entities.MatchedRoute, Tfl.Api.Presentation.Entities',
 'name': 'Canada Water Bus Station - Tottenham Court Road',
 'direction': 'inbound',
 'originationName': 'Canada Water Bus Station',
 'destinationName': 'Tottenham Court Road',
 'originator': '490004733C',
 'destination': '490000235N',
 'serviceType': 'Regular',
 'validTo': '2022-12-23T00:00:00Z',
 'validFrom': '2022-01-08T00:00:00Z'}
```


```
[136]: tubeline_count = 0
busline_count = 0
tube_list = []
flag = 0

for i, line in enumerate(tubeBus_response.json()):
    if tubeBus_response.json()[i]['modeName'] == 'bus':
        busline_count+=1
    elif tubeBus_response.json()[i]['modeName'] == 'tube':
        tubeline_count+=1
        tube_list.append('Inbound: ' +tubeBus_response.json()[i]['routeSections'][0]['name'])
        tube_list.append('Outbound: ' +tubeBus_response.json()[i]['routeSections'][1]['name'])
    else:
        pass
print(f'Number of bus lines: {busline_count}, Number of tube lines: {tubeline_count}')
print(f'Number of tube and bus lines in London: {busline_count+tubeline_count}')

#To control Inbound and Outbound Line Printing.
for name in tube_list:
    if flag == 0:
        print(f'Tube Name: {name}')
        flag+=1
    elif flag == 1:
        print(f'Tube Name: {name}')
        flag = 0
    else:
        pass
```

```
Number of bus lines: 678, Number of tube lines: 11
Number of tube and bus lines in London: 689
Tube Name: Inbound: Harrow & Wealdstone Underground Station - Elephant & Castle Underground Station
Tube Name: Outbound: Elephant & Castle Underground Station - Harrow & Wealdstone Underground Station
Tube Name: Inbound: Epping Underground Station - West Ruislip Underground Station
Tube Name: Outbound: West Ruislip Underground Station - Epping Underground Station
```

Conclusion

- What could I have done better?
  - Make more functions for repetitive operations.
  - Unify the code into one big program.
  - Functions for all the tasks/questions.
  - Using python plotting libraries for my diagrams.