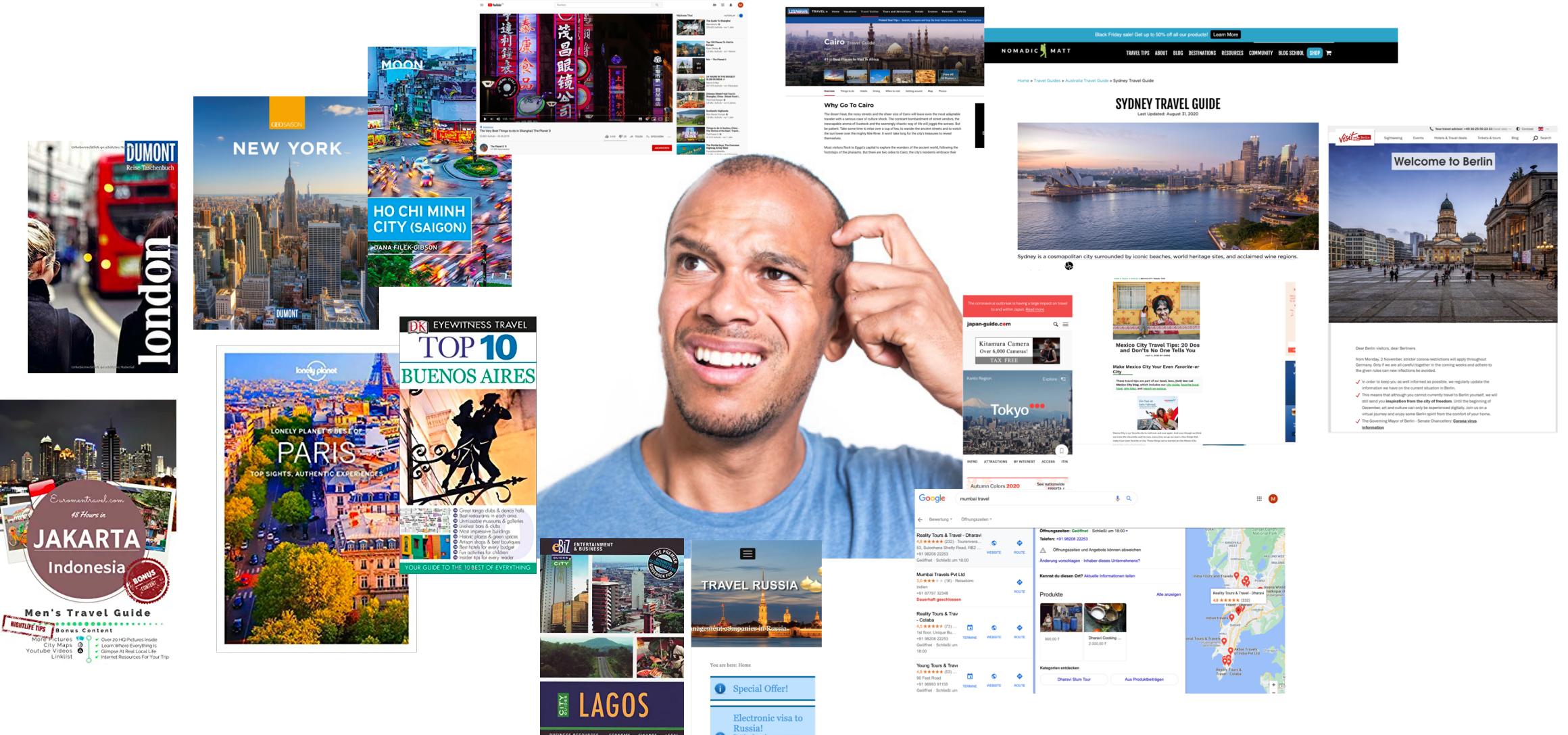


*Let's do ANY CITY in 3 days!*

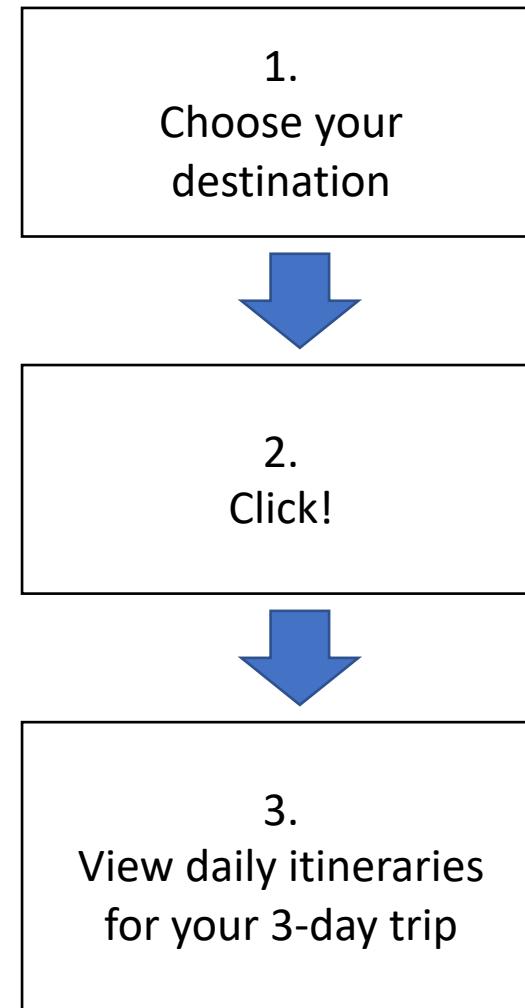
Coursera *IBM Data Science Professional*  
Capstone Project

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# Travel planning is such a hassle!



# Couldn't this be easier?



# FourSquare.com has all the data you need ...

The screenshot shows the Foursquare City Guide interface for Hamburg. At the top, there's a search bar with "I'm looking for..." and a "Current Map View" button. To the right are "Log In" and "Sign Up" buttons. Below the search bar, a blue banner says "Discover places that your friends and experts love" with a message about creating an account to follow friends and experts. It includes "Sign up with Facebook" and "Sign up with email" buttons.

The main area features a map of Hamburg with numerous blue location pins numbered from 1 to 30. The map shows the city's layout with green areas for parks and blue lines for waterways. Below the map, a list of three recommended places is shown:

- 1. Isemarkt**: Farmer's Market in Isestr., Hamburg. Rating 9.5. Photo of a market stall. Includes a "Save" button.
- 2. Savoy**: Movie Theater at Steindamm 54, Hamburg. Rating 9.5. Photo of theater seating. Includes a "Save" button.
- 3. Zeit für Brot**: Find the best places to eat, drink, shop and visit. Rating 9.5. Photo of bread products.

At the bottom, there's a footer with the Foursquare logo, a five-star rating, and the text "Find the best places to eat, drink, shop and visit." On the right side of the footer are buttons for "+123 456 7890" and "TEXT ME THE APP".

# ... and you can access the database via api!

The screenshot shows the Foursquare Developers account management interface. The top navigation bar includes links for 'FOURSQUARE /developers', 'Support', 'Docs', and 'My Account'. On the left sidebar, there are links for 'My Apps', 'Account' (which is selected), 'Profile', and 'Manage Billing'. The main content area is titled 'Manage Billing' and 'Account Tier'. It states that the current account tier is Personal and lists the following features: 99,500 Regular Calls / Day, 500 Premium Calls / Day, 2 Photos per Venue, and 2 Tips per Venue. There is a link to 'Upgrade Now' if looking to build something for a commercial application. Below this is a 'Billing Summary' section with columns for 'Date Posted', 'Description', and 'Total Amount'. A message indicates 'You have no billing transactions'. At the bottom, there are links for 'Feedback', 'Credit Cards' (which is selected), and 'Add New Card'.

# What do we want to do on our 3 day trip?

Each day, we want to ...

... have breakfast in a nice cafe or coffee house

... visit the 3 top rated museums

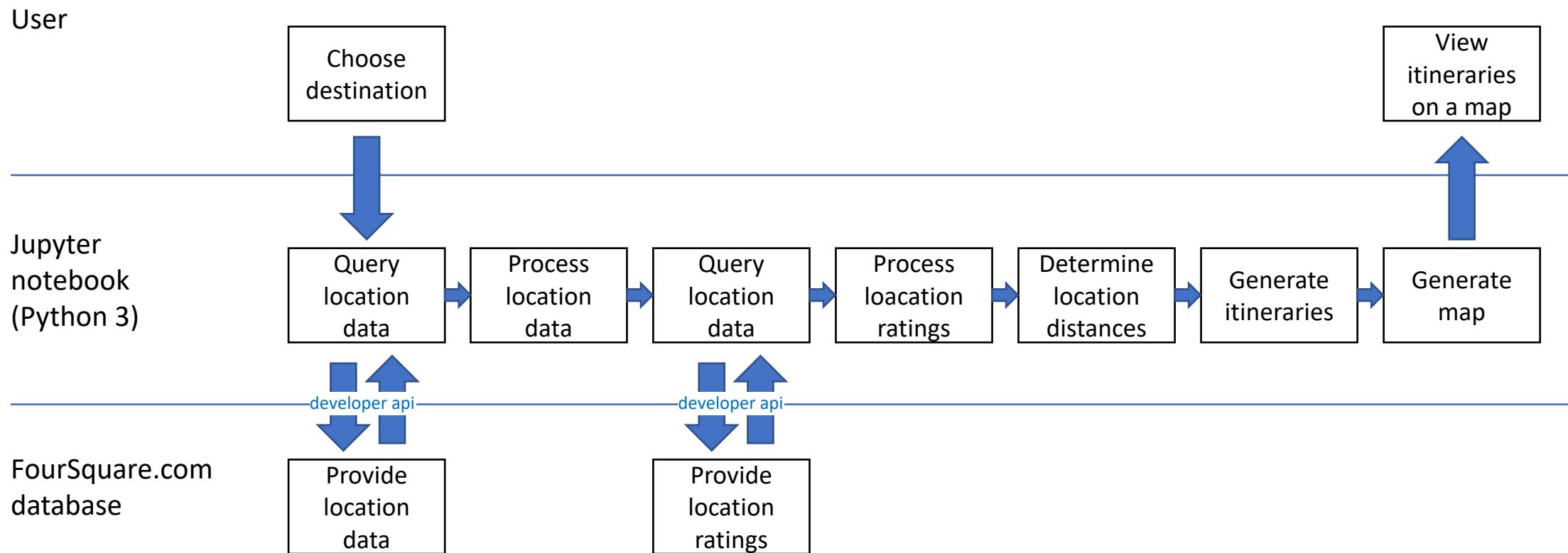
... experience the 3 top rated sights

... have dinner in a nice restaurant

... have a night cap or have some fun!

And of course: The hotel should be top rated and located conveniently!

# How's our tool going to work?



# We'll use a Python 3 Jupyter notebook

The screenshot shows a Jupyter Notebook interface with a Python 3 kernel. The code cells contain Python code for geocoding a target city and retrieving venues from Foursquare.com.

```
print('Libraries imported.')
Libraries imported.

2. Determine geographic coordinates of target city
[360...]
address = 'Hamburg, Germany'

geolocator = Nominatim(user_agent="city_explorer")
location = geolocator.geocode(address)
latitude = location.latitude
longitude = location.longitude
print('The geographical coordinates of {} are {}, {}'.format(address, latitude, longitude))
The geographical coordinates of Hamburg, Germany are 53.550341, 10.000654.

3. Retrieve venues in target city from Foursquare.com

The objective of this project is to generate a unique itinerary for each of the 3 days of the trip to the target city.

Each day should include the following 5 items:
1. An area with many breakfast venues ("breakfast area")
2. One of the 3 top rated museums ("top museum")
3. One of the 3 top rated sights ("top sight")
4. An area with many restaurants ("dining area")
5. An areas with many bars and clubs ("nightlife area")

3.1 Search for areas with top rated breakfast venues
3.1.1 Retrieve all breakfast venues of target city as a dataframe
[361...]
# Foursquare.com credentials and parameters
CLIENT_ID = 'XYZ' # your Foursquare ID
CLIENT_SECRET = 'XYZ' # your Foursquare Secret
VERSION = '20201110' # Foursquare API version

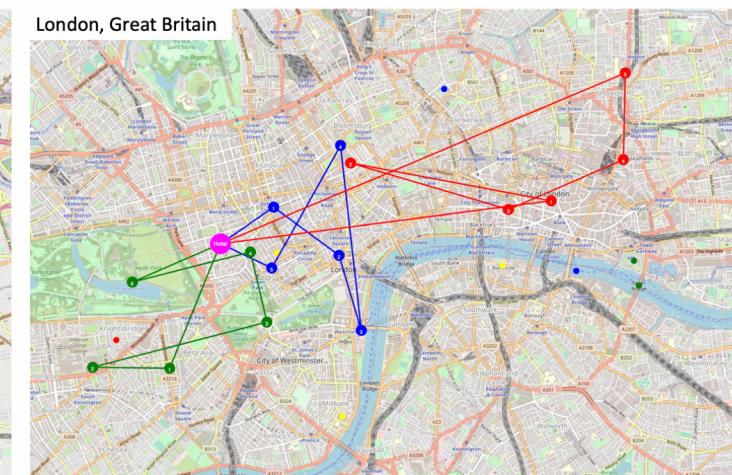
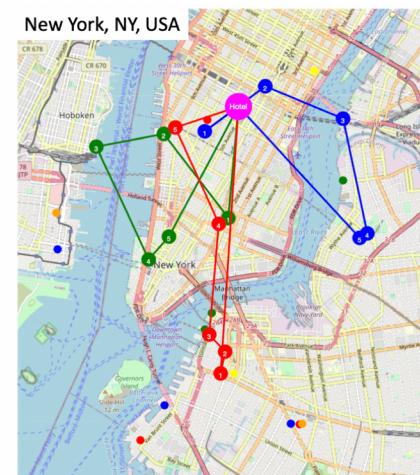
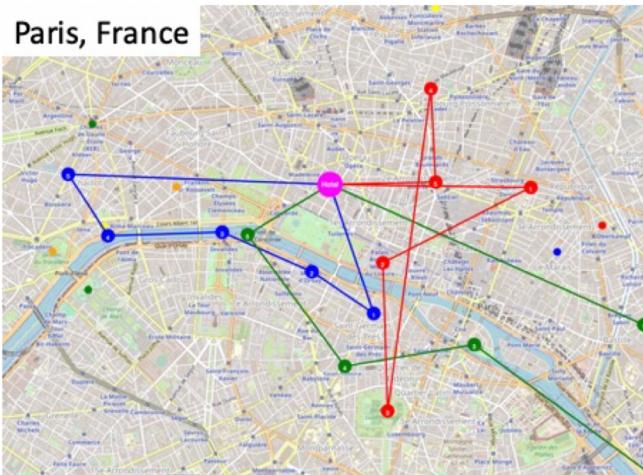
categoryId='4bf58dd8d48988d179941735,4bf58dd8d48988d143941735,4bf58dd8d48988d16d941735,4bf58dd8d48988d1e0931735,4bf58dd8d48988d147941735,4bf58dd8d48988d148941735'

#Bagel Shop
#4bf58dd8d48988d179941735
#Breakfast Spot
#4bf58dd8d48988d143941735
#Café
#4bf58dd8d48988d16d941735
```

# Let's see, what we get...

- The tool provides 3 unique itineraries with just two user inputs (type in destination and click once)
- The results are shown in a map
- It's easy and results are shown in seconds!

Sample results:



# Let's throw some stones...

- The use of the tools requires a python installation and a(free) FourSquare.com developer's account
- The FourSquare.com database may lack detail for smaller or less touristy cities, which could limit the locations included in the itineraries.
- The strict daily routine and the restriction that each itinerary must be unique can lead to itineraries that criss-cross across a rather larger area of the city. This is probably most evident in smaller cities with less available locations to choose from.
- The FourSquare.com developers api provides easy access to the huge location database. However, queries are sometimes rather slow to respond (e.g. retrieving venue ratings) and using a free account can be cumbersome due to the limited number of daily premium calls.

# Ideas for further improvements...

- A web frontend or mobile app would improve user friendliness (e.g. no need to install python etc.)
- More intricate algorithms and more flexible daily routines could improve the results (e.g. less “criss-crossing across wider areas”)
- Additional features could be added, like online ordering of tickets or reservation of tables at the restaurants