



Project 3

Data Engineering

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Project Summary



- If someone could travel to any of the concert locations in the US or Canada for the “Las Mujeres No Lloran World Tour,” which one would be the most budget-friendly concert location, and what is the budget range per concert?

city	concert_date	checkin_date	SQL QUERY OUTCOME		TICKETMASTER API	HOTELS.COM SCRAPPING		TICKETMASTER API	HOTELS.COM SCRAPPING	
			min_budget	max_budget	ticket_min_price	min_hotel	hotel_name_for_min_price	ticket_max_price	max_hotel	hotel_name_for_max_price
Montreal	2024-12-10	2024-12-09	146.5	4786.5	119.5	27	Hygie Pod Hotel - Hostel	4344.5	442	Fairmont The Queen Elizabeth Gold Experience
Charlotte	2024-11-23	2024-11-22	201.5	1078.5	129.5	72	Royal Inn Charlotte Airport Hotel	429.5	649	The Ritz-Carlton, Charlotte
Washington	2024-11-25	2024-11-24	204.5	999.5	129.5	75	Motto by Hilton Washington DC City Center	429.5	570	Waldorf Astoria Washington DC
Phoenix	2024-11-07	2024-11-06	210.5	1254.5	144.5	66	Econo Lodge Phoenix North I-17	484.5	770	The Global Ambassador
Miami	2024-11-20	2024-11-19	219.5	1161.5	145.5	74	Up Midtown	485.5	676	Four Seasons Hotel Miami
Boston	2024-12-08	2024-12-07	221.5	1203.5	119.5	102	Temple Place Suites	399.5	804	Raffles Boston
Dallas	2024-11-17	2024-11-16	222.5	1175.5	149.5	73	Serene Dallas Condo w/ Pool - Walkable Location!	491.5	684	Hôtel Swexan
Miami	2024-11-21	2024-11-20	222.5	1197.5	145.5	77	Up Midtown	485.5	712	Four Seasons Hotel Miami
Chicago	2024-12-14	2024-12-13	230.5	931	144.5	86	Ohio House Motel	485	446	Trump International Hotel & Tower Chicago
Toronto	2024-11-30	2024-11-29	236.5	1113.5	139.5	97	The Rex Hotel	459.5	654	The Hazelton Hotel Toronto
Brooklyn	2024-12-05	2024-12-04	253.5	1392.5	149.5	104	NY Moore Hostel	489.5	903	The Wall Street Hotel
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Palm Desert	2024-11-03	2024-11-02	277.5	4404.75	201.5	76	Rodeway Inn & Suites Thousand Palms - Rancho Mirage	564.75	3840	Villa Verbena by Avantstay Expansive Estate w/ B-ball Court, Pool/spa & Entertainer's Yard
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Brooklyn	2024-12-06	2024-12-05	310.5	2986.5	149.5	161	Super 8 by Wyndham Brooklyn Fulton Street/Broadway Junction	489.5	2497	Holiday Inn Express New York City- Wall Street, an IHG Hotel
Inglewood	2024-11-09	2024-11-08	334.5	866.5	249.5	85	Royal Century Hotel	589.5	277	Four Points by Sheraton Los Angeles Westside

Ticketmaster API



Discovery API - V 2.0

- The Ticketmaster Discovery API allows to search for events, attractions, or venues
- To run a successful API call, we had to pass the **API Key** in the “apikey” query parameter
- To get a list of all events for Shakira’s Tour in the USA and Canada we had to use the following parameters:

○

```
# Define the base URL and parameters based on the documentation of the Ticketmaster API
base_url = 'https://app.ticketmaster.com/discovery/v2/events?'

params = {'apikey' : ticketmaster_api_key,
          'keyword': 'Shakira - Las Mujeres Ya No Lloran - World Tour',
          'countryCode': ["us", " ca"],
          'locale': '*' }
```

Ticketmaster API



- The JSON response has dictionary of events
 -
- On the dictionary of each event we found the concert id, dates, price range (min and max) and the venue info

```
# Get to the dictionary that contains the concerts information
concerts = events['_embedded']['events']
pprint(concerts)
```

```
{'name': 'Shakira - Las Mujeres Ya No Lloran - World Tour',
 'type': 'event',
 'id': 'G5eVZbFMb0bre',
```

```
  'dates': {'start': {'localDate': '2024-11-23',
                    'localTime': '19:30:00',
                    'dateTime': '2024-11-24T00:30:00Z',
                    'dateTBD': False,
                    'dateTBA': False,
                    'timeTBA': False,
                    'noSpecificTime': False},
            'timezone': 'America/New_York',
            'status': {'code': 'cancelled'},
            'spanMultipleDays': False},
```

```
  'priceRanges': [{'type': 'standard',
                    'currency': 'USD',
                    'min': 129.5,
                    'max': 429.5}],
```

```
  '_embedded': {'venues': [{'name': 'Spectrum Center ',
                             'type': 'venue',
                             'id': 'KovZpZAGAEIA',
                             'test': False,
                             'url': 'https://www.ticketmaster.com/spectrum-center-tickets-charlotte/venue/369357',
                             'locale': 'en-us',
                             'images': [{'ratio': '16_9',
                                         'url': 'https://s1.ticketm.net/dbimages/18670v.jpg',
                                         'width': 205,
                                         'height': 115,
                                         'fallback': False}],
                             'postalCode': '28202',
                             'timezone': 'America/New_York',
                             'city': {'name': 'Charlotte'},
                             'state': {'name': 'North Carolina', 'stateCode': 'NC'},
                             'country': {'name': 'United States Of America', 'countryCode': 'US'},
                             'address': {'line1': '333 East Trade Street'},
                             'location': {'longitude': '-80.839921', 'latitude': '35.225222'},
```


Ticketmaster API



- Using a for loop, we created a list of dictionaries for concerts and venues:

```
# Create a list of dictionaries to store the key information about the concert and tickets price
dict_of_concerts = {}

# Loop through all the concerts and extract relevant information
for concert in concerts:
    concert_dict = {}

    if (concert['dates']['status']['code'] != 'offsale'):
        # Use the concert ID as the index to add the concert_dict to the dict_of_concerts
        concert_id = concert['id']

        concert_name = concert['name']
        concert_dict['Concert_Name'] = concert_name
        concert_date = concert['dates']['start']['localDate']
        concert_dict['Concert_Date'] = concert_date
        ticket_sale_status = concert['dates']['status']['code']
        concert_dict['Ticket_Sale_Status'] = ticket_sale_status

        # Use a try-except statement for variables that aren't necessarily common to all the concerts
        try:
            ticket_min_price = concert['priceRanges'][0]['min']
            concert_dict['Ticket_Min_Price'] = ticket_min_price
            ticket_max_price = concert['priceRanges'][0]['max']
            concert_dict['Ticket_Max_Price'] = ticket_max_price
        except (KeyError):
            concert_dict['Ticket_Min_Price'] = 'Concert is in presale. General pricing is not available'
            concert_dict['Ticket_Max_Price'] = 'Concert is in presale. General pricing is not available'

        try:
            ticket_limit = concert['ticketLimit']['info']
            concert_dict['Ticket_Limitation'] = ticket_limit
        except (KeyError):
            concert_dict['Ticket_Limitation'] = 'No Limit'

        venue_id = concert['embedded']['venues'][0]['id']
        concert_dict['Venue_ID'] = venue_id

        # Add the concert_dict to the dict_of_concerts
        dict_of_concerts[concert_id] = concert_dict
```



```
{'G5eVZbFMb0bre': {'Concert_Name': 'Shakira - Las Mujeres Ya No Lloran - World Tour',
'Concert_Date': '2024-11-23',
'Ticket_Sale_Status': 'cancelled',
'Ticket_Min_Price': 129.5,
'Ticket_Max_Price': 429.5,
'Ticket_Limitation': 'No Limit',
'Venue_ID': 'KovZpZA6AEIA'},
'G5dIZbFwIrg08': {'Concert_Name': 'Shakira - Las Mujeres Ya No Lloran - World Tour',
'Concert_Date': '2024-11-16',
'Ticket_Sale_Status': 'cancelled',
'Ticket_Min_Price': 189.5,
'Ticket_Max_Price': 499.5,
'Ticket_Limitation': 'There is an overall 6 ticket limit for this event.',
'Venue_ID': 'KovZpZAJJEaA'},
'vVG1VZbFU3Rv5A': {'Concert_Name': 'Shakira - Las Mujeres Ya No Lloran - World Tour',
'Concert_Date': '2024-11-20',
'Ticket_Sale_Status': 'cancelled',
'Ticket_Min_Price': 145.5,
'Ticket_Max_Price': 485.5,
'Ticket_Limitation': 'There is a six (6) ticket limit for this event.',
'Venue_ID': 'KovZpZAJtFaA'},
'vv170ZbFGkMDd40B': {'Concert_Name': 'Shakira - Las Mujeres Ya No Lloran - World Tour',
'Concert_Date': '2024-11-09',
'Ticket_Sale_Status': 'cancelled',
'Ticket_Min_Price': 249.5,
...
'Ticket_Sale_Status': 'rescheduled',
'Ticket_Min_Price': 139.5,
'Ticket_Max_Price': 459.5,
'Ticket_Limitation': 'There is an overall 6 ticket limit for this event.',
'Venue_ID': 'KovZpZAFFE1A'}}
```

Ticketmaster API



- At the end of the process we created and export the CSVs of the following Data Frames:
 - concerts_df & venues_df
 - lodging_info_df - Filtered df after joining concerts and venues (for the project we defined the CheckIn_Date as the day before the concert & the CheckOut_Date as the day after the concert)

concerts_df.info()

✓ 0.0s

<class 'pandas.core.frame.DataFrame'>

RangeIndex: 17 entries, 0 to 16

Data columns (total 8 columns):

#	Column	Non-Null Count	Dtype
0	Event_ID	17 non-null	object
1	Concert_Name	17 non-null	object
2	Concert_Date	17 non-null	datetime64[ns]
3	Ticket_Sale_Status	17 non-null	object
4	Ticket_Min_Price	17 non-null	float64
5	Ticket_Max_Price	17 non-null	float64
6	Ticket_Limitation	17 non-null	object
7	Venue_ID	17 non-null	object

venues_df.info()

✓ 0.0s

<class 'pandas.core.frame.DataFrame'>

RangeIndex: 14 entries, 0 to 13

Data columns (total 8 columns):

#	Column	Non-Null Count	Dtype
0	Venue_ID	14 non-null	object
1	Venue_Name	14 non-null	object
2	Longitude	14 non-null	float64
3	Latitude	14 non-null	float64
4	Country	14 non-null	object
5	State	14 non-null	object
6	City	14 non-null	object
7	Address	14 non-null	object

lodging_info_df.info()

✓ 0.0s

<class 'pandas.core.frame.DataFrame'>

RangeIndex: 17 entries, 0 to 16

Data columns (total 7 columns):

#	Column	Non-Null Count	Dtype
0	Concert_Date	17 non-null	datetime64[ns]
1	Venue_ID	17 non-null	object
2	Country	17 non-null	object
3	State	17 non-null	object
4	City	17 non-null	object
5	CheckIn_Date	17 non-null	datetime64[ns]
6	CheckOut_Date	17 non-null	datetime64[ns]

Ticketmaster API

On Friday Oct 18th Shakira decided to change the dates of the tour in the US and Canada




NEW YORK WEATHER LOCAL NBC NY 24/7 VIDEO NE... Watch News 24/7

CONCERTS

Shakira cancels NY concerts, moves tour to May after switching from arenas to stadiums due to demand

By SANDRA ESCALLÓN, Russell Rúa and TELEMUNDO 47 • Published October 18, 2024 • Updated on October 18, 2024 at 7:21 pm



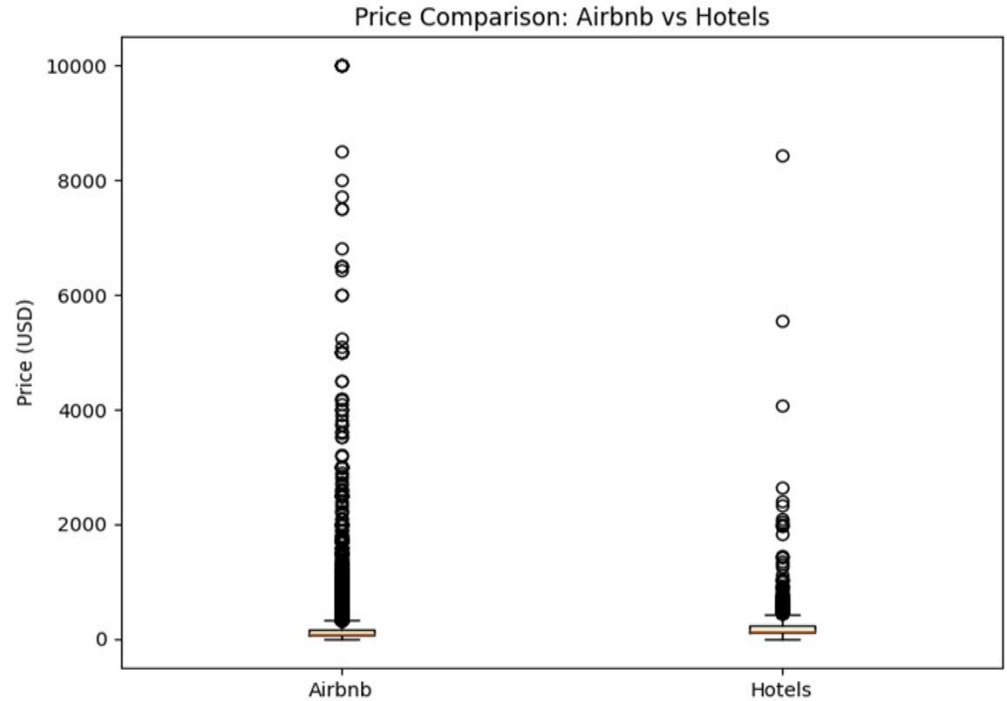
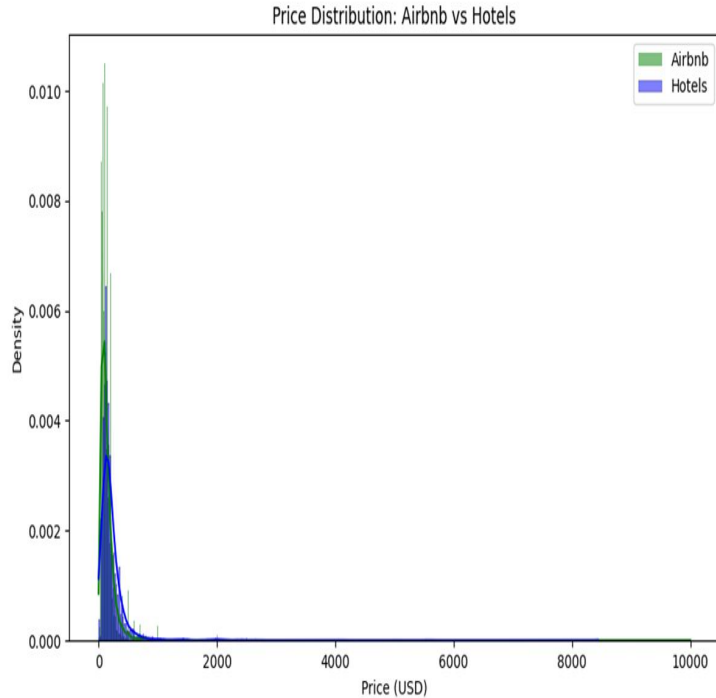
Colombian singer Shakira announced on her social media that due to the high demand for her concerts, she will postpone the Las Mujeres Ya No Lloran tour to May 2025.

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IRS announces new federal income tax brackets for 2025
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What is Prop 1? New York set to vote on state constitutional amendment on Election Day

	Event_ID	Concert_Name	Concert_Date	Ticket_Sale_Status	Ticket_Min_Price	Ticket_Max_Price	Ticket_Limitation	Venue_ID
0	vv17OZbFGkU9i-pl	Shakira - Las Mujeres Ya No Lloran - World Tour	2025-05-22	rescheduled	59.5	259.50	There is an overall 6 ticket limit for this ev...	KovZ917A25V
1	1Av0ZbFGkTIDVAd	Shakira - Las Mujeres Ya No Lloran - World Tour	2025-06-22	rescheduled	144.5	484.50	There is an overall 6 ticket limit for this ev...	KovZpZAE617A
2	vvG11ZbFTpNCA	Shakira - Las Mujeres Ya No Lloran - World Tour	2024-11-03	cancelled	201.5	564.75	There is an overall 6 ticket limit for this ev...	KovZ917A-Tn
3	vvG1VZbFUJ3Rv5A	Shakira - Las Mujeres Ya No Lloran - World Tour	2024-11-20	cancelled	145.5	485.50	There is a six (6) ticket limit for this event.	KovZpZAJtFaA
4	G5dlZbFwlrqO8	Shakira - Las Mujeres Ya No Lloran - World Tour	2024-11-16	cancelled	189.5	499.50	There is an overall 6 ticket limit for this ev...	KovZpZAJJEdA
5	vvG11ZbFSkKfhJ	Shakira - Las Mujeres Ya No Lloran - World Tour	2024-11-02	cancelled	201.5	564.75	There is an overall 6 ticket limit for this ev...	KovZ917A-Tn
6	G5eVZbFMbObre	Shakira - Las Mujeres Ya No Lloran - World Tour	2024-11-23	cancelled	129.5	429.50	No Limit	KovZpZA6AEIA
7	vvG1VZbFX9ZdVo	Shakira - Las Mujeres Ya No Lloran - World Tour	2024-11-21	cancelled	145.5	485.50	There is a six (6) ticket limit for this event.	KovZpZAJtFaA
8	vv17OZbFGkMDd4OB	Shakira - Las Mujeres Ya No Lloran - World Tour	2024-11-09	cancelled	249.5	589.50	There is an overall 6 ticket limit for this ev...	KovZpZAEKn6A
9	vv178ZbFGkR05dgA	Shakira - Las Mujeres Ya No Lloran - World Tour	2024-12-14	cancelled	144.5	485.00	There is an overall 6 ticket limit for this ev...	KovZpa2M7e
10	vvG1YZbFSrWgPY	Shakira - Las Mujeres Ya No Lloran - World Tour	2024-11-17	cancelled	149.5	491.50	There is an overall 6 ticket limit for this ev...	KovZpZAJ67eA
11	1AvfZbFGkRnDJIs	Shakira - Las Mujeres Ya No Lloran - World Tour	2024-11-25	cancelled	129.5	429.50	There is an overall 6 ticket limit for this ev...	KovZpaKwJe
12	1AdZZbFGkw3sSf	Shakira - Las Mujeres Ya No Lloran - World Tour	2024-12-05	cancelled	149.5	489.50	There is a 6 ticket limit on this event	KovZ917AtP3
13	vv177ZbFGkwEuVoY	Shakira - Las Mujeres Ya No Lloran - World Tour	2024-12-08	cancelled	119.5	399.50	There is an overall 6 ticket limit for this ev...	KovZpa2gne
14	1AYZke8GkdyVgh8	Shakira - Las Mujeres Ya No Lloran - World Tour	2024-12-06	cancelled	149.5	489.50	There is a 6 ticket limit on this event	KovZ917AtP3
15	1Ad7ZbFGkmFYsMD	Shakira - Las Mujeres Ya No Lloran - World Tour	2025-05-20	rescheduled	119.5	4344.50	Il y a une limite de 6 billets pour cet évènement...	KovZpauRJe
16	1AvZZbFGkRDEKcW	Shakira - Las Mujeres Ya No Lloran - World Tour	2025-05-26	rescheduled	139.5	459.50	There is an overall 6 ticket limit for this ev...	KovZpZAFFE1A

Airbnb vs hotel pricing comparison



Scrapping Process

- 1) Input data gathered from Ticketmaster.
- 2) Create list of urls that will be scraped.
- 3) Loop thru urls and save that data into a dictionary of list.
- 4) Clean data.
- 5) Convert data into a dataframe to be uploaded into Postgres for analysis.



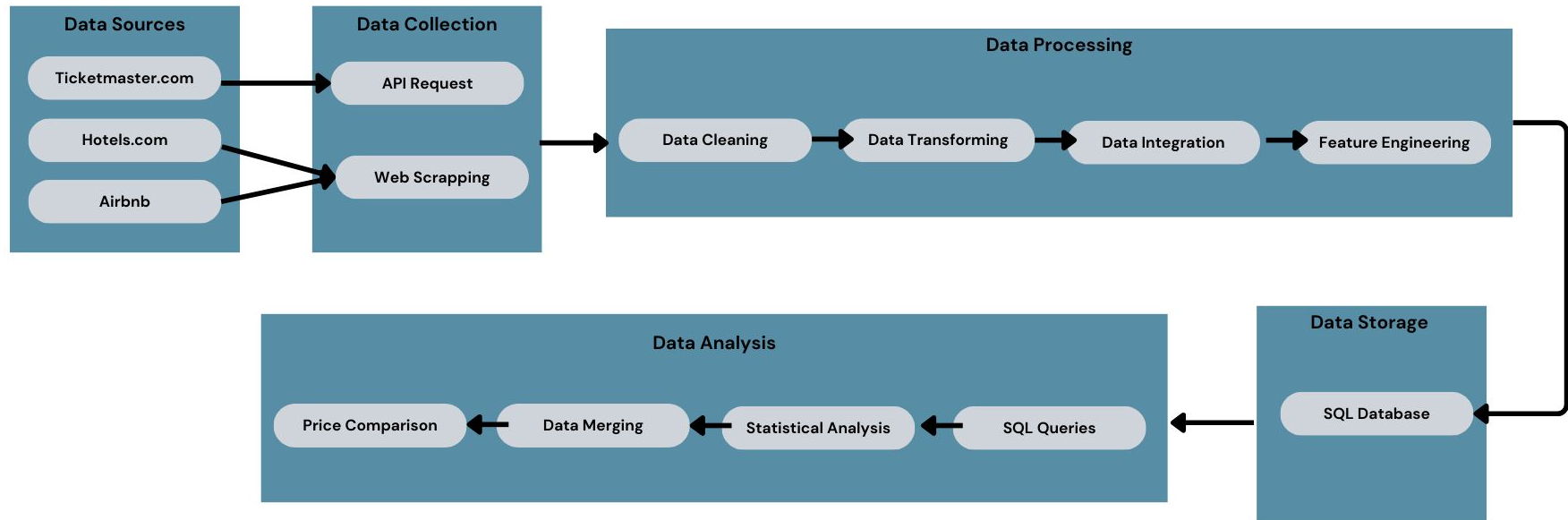
Code Demo

`urllib.parse` — Parse URLs into components

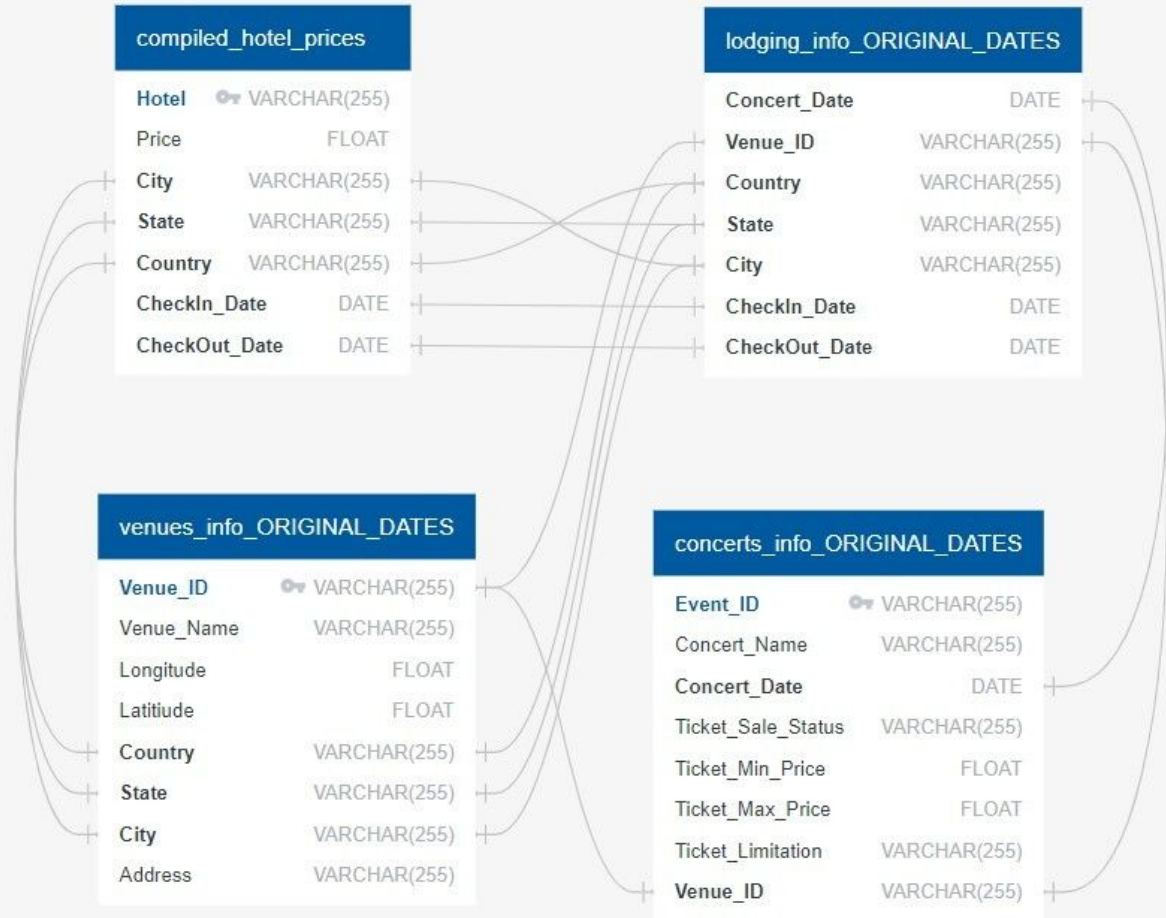
Source code: [Lib/urllib/parse.py](#)

This module defines a standard interface to break Uniform Resource Locator (URL) strings up in components (addressing scheme, network location, path etc.), to combine the components back into a URL string, and to convert a "relative URL" to an absolute URL given a "base URL."

Project Pipeline



ERD



SQL Queries

```
CREATE TABLE compiled_hotel_prices (  
    Hotel VARCHAR NOT NULL,  
    Price INT NOT NULL,  
    CheckIn_Date DATE NOT NULL,  
    CheckOut_Date DATE NOT NULL,  
    City VARCHAR NOT NULL,  
    State VARCHAR NOT NULL,  
    Country VARCHAR NOT NULL  
);  
  
CREATE TABLE concerts_info_ORIGINAL_DATES (  
    Event_ID VARCHAR NOT NULL,  
    Concert_Name VARCHAR NOT NULL,  
    Concert_Date DATE NOT NULL,  
    Ticket_Sales_Status VARCHAR NOT NULL,  
    Ticket_Min_Price FLOAT NOT NULL,  
    Ticket_Max_Price FLOAT NOT NULL,  
    Ticket_Limitation VARCHAR NOT NULL,  
    Venue_ID VARCHAR NOT NULL  
);  
  
CREATE TABLE venues_info_ORIGINAL_DATES (  
    Venue_ID VARCHAR NOT NULL,  
    Venue_Name VARCHAR NOT NULL,  
    Longitude FLOAT NOT NULL,  
    Latitude FLOAT NOT NULL,  
    Country VARCHAR NOT NULL,  
    State VARCHAR NOT NULL,  
    City VARCHAR NOT NULL,  
    Address VARCHAR NOT NULL  
);  
  
CREATE TABLE lodging_info_ORIGINAL_DATES (  
    Concert_Date DATE NOT NULL,  
    Venue_ID VARCHAR NOT NULL,  
    Country VARCHAR NOT NULL,  
    State VARCHAR NOT NULL,  
    City VARCHAR NOT NULL,  
    CheckIn_Date DATE NOT NULL,  
    CheckOut_Date DATE NOT NULL  
);
```



```
--query to find the min_budget and max_budget  
SELECT sindys_results.city,  
    sindys_results.concert_date,  
    sindys_results.checkin_date, -- Include checkin_date in the outer query  
    ticket_min_price + min_hotel as min_budget,  
    ticket_max_price + max_hotel as max_budget,  
    sindys_results.ticket_min_price,  
    sindys_results.min_hotel,  
    CHP_min.hotel as hotel_name_for_min_price,  
    sindys_results.ticket_max_price,  
    sindys_results.max_hotel,  
    CHP_max.hotel as hotel_name_for_max_price  
FROM (  
    SELECT compiled_hotel_prices.city,  
        lodging_info_ORIGINAL_DATES.concert_date,  
        lodging_info_ORIGINAL_DATES.checkin_date,  
        concerts_info_ORIGINAL_DATES.ticket_min_price,  
        concerts_info_ORIGINAL_DATES.ticket_max_price,  
        MIN(compiled_hotel_prices.price) AS min_hotel,  
        MAX(compiled_hotel_prices.price) AS max_hotel  
    FROM compiled_hotel_prices  
    LEFT JOIN lodging_info_ORIGINAL_DATES  
    ON compiled_hotel_prices.checkin_date = lodging_info_ORIGINAL_DATES.checkin_date  
    LEFT JOIN concerts_info_ORIGINAL_DATES  
    ON lodging_info_ORIGINAL_DATES.venue_id = concerts_info_ORIGINAL_DATES.venue_id  
    GROUP BY lodging_info_ORIGINAL_DATES.concert_date,  
        lodging_info_ORIGINAL_DATES.checkin_date,  
        compiled_hotel_prices.city,  
        concerts_info_ORIGINAL_DATES.ticket_min_price,  
        concerts_info_ORIGINAL_DATES.ticket_max_price  
    ) as sindys_results  
LEFT JOIN compiled_hotel_prices as CHP_min ON sindys_results.min_hotel = CHP_min.price AND sindys_results.checkin_date = CHP_min.checkin_date  
LEFT JOIN compiled_hotel_prices as CHP_max ON sindys_results.max_hotel = CHP_max.price AND sindys_results.checkin_date = CHP_max.checkin_date  
ORDER BY min_budget
```

Query Outcome Structure

Subquery

- compiled_hotel_prices
- lodging_info
- concerts_info

Group by

- Concert date
- CheckIn date
- City
- Ticket min price
- Ticket max price

Outer join to get the hotel name for the min and the max hotel price

SQL Query Outcome

“Data... don't lie”



		SQL QUERY OUTCOME			TICKETMASTER API	HOTELS.COM SCRAPPING		TICKETMASTER API	HOTELS.COM SCRAPPING	
city	concert_date	checkin_date	min_budget	max_budget	ticket_min_price	min_hotel	hotel_name_for_min_price	ticket_max_price	max_hotel	hotel_name_for_max_price
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Chicago	2024-12-14	2024-12-13	230.5	931	144.5	86	Ohio House Motel	485	446	Trump International Hotel & Tower Chicago
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Inglewood	2024-11-09	2024-11-08	334.5	866.5	249.5	85	Royal Century Hotel	589.5	277	Four Points by Sheraton Los Angeles Westside

Ethical Considerations

Hotels.com - Terms of Service / Ticketmaster.com - Terms of Use

- Allows for personal and non-commercial use
- Prohibits data scraping on the website
- Educational use, allowed

Ticketmaster website blocks or pauses traditional web scraping and also prohibits the use of any software to go around the blocking or pausing security measures

Only way to get ethically or legally get Ticketmaster data is from their API



Questions?