SQL Murder Mystery

- There's been a Murder in SQL City! The SQL Murder Mystery is designed to be both a self-directed lesson to learn SQL concepts and commands and a fun game for experienced SQL users to solve an intriguing crime.
- A crime has taken place and the detective needs your help. The detective gave you the crime scene report, but you somehow lost it. You vaguely remember that the crime was a murder that occurred sometime on Jan.15, 2018, and that it took place in SQL City.
- Start by retrieving the corresponding crime scene report from the police department's database.

```
import numpy as np
import pandas as pd
import requests
import sqlite3        # For Handling database
```

```
#Setting connection with database
url = "https://raw.githubusercontent.com/rajvalvi/Prepinsta-Winter-Internship-in-Data-Analytics/main/week-5/sql-murder-mystery.db"
r = requests.get(url, allow_redirects=True)
open('sql-murder-mystery.db', 'wb').write(r.content)
conn = sqlite3.connect('sql-murder-mystery.db')
```

```
#cheking connection
print(conn)
```

```
<sqlite3.Connection object at 0x7ca2e6708940>
```

```
#All tables in sql-murder-mystery database
show_tables = pd.read_sql_query("SELECT name FROM sqlite_master WHERE type='table'",conn)
print(show_tables)
```

```
                    name
0      crime_scene_report
1         drivers_license
2                  person
3  facebook_event_checkin
4              interview
5      get_fit_now_member
6    get_fit_now_check_in
7                  income
8                solution
```

```
pd.set_option('display.max_colwidth', None)
```

```
# watching all the tables from the database
```

```
crime_scene_report=pd.read_sql_query("SELECT * FROM crime_scene_report;",conn)
crime_scene_report.head()
```

	date	type	description	city
0	20180115	robbery	A Man Dressed as Spider-Man Is on a Robbery Spree	NYC
1	20180115	murder	Life? Dont talk to me about life.	Albany
2	20180115	murder	Mama, I killed a man, put a gun against his head...	Reno
3	20180215	murder	REDACTED REDACTED REDACTED	SQL City
4	20180215	murder	Someone killed the guard! He took an arrow to the knee!	SQL City

```
drivers_license = pd.read_sql_query("SELECT * FROM drivers_license", conn)
drivers_license.head()
```

	id	age	height	eye_color	hair_color	gender	plate_number	car_make	car_mo
0	100280	72	57	brown	red	male	P24L4U	Acura	M
1	100460	63	72	brown	brown	female	XF02T6	Cadillac	S
2	101029	62	74	green	green	female	VKY5KR	Scion	
3	101198	43	54	amber	brown	female	Y5NZ08	Nissan	Ro
4	101255	18	79	blue	grey	female	51627J	Lexus	

```
person= pd.read_sql_query("SELECT * FROM person",conn)
person.head()
```

	id	name	license_id	address_number	address_street_name	ssn
0	10000	Christoper Peteuil	993845	624	Bankhall Ave	747714076
1	10007	Kourtney Calderwood	861794	2791	Gustavus Blvd	477972044
2	10010	Muoi Cary	385336	741	Northwestern Dr	828638512

```
facebook_event_checkin= pd.read_sql_query("SELECT * FROM facebook_event_checkin",conn)
facebook_event_checkin.head()
```

	person_id	event_id	event_name	date
0	28508	5880	Nudists are people who wear one-button suits.\n	20170913
1	63713	3865	but that's because it's the best book on anything for the layman.\n	20171009
2	63713	3999	If Murphy's Law can go wrong, it will.\n	20170502
3	63713	6436	Old programmers never die. They just branch to a new address.\n	20170926

```
interview= pd.read_sql_query("SELECT * FROM interview",conn)
interview.head()
```

	person_id	transcript
0	28508	‘I deny it!’ said the March Hare.\n
1	63713	\n
2	86208	way, and the whole party swam to the shore.\n
3	35267	lessons in here? Why, there’s hardly room for YOU, and no room at all\n
4	33856	\n

```
get_fit_now_member= pd.read_sql_query("SELECT * FROM get_fit_now_member",conn)
get_fit_now_member.head()
```

	id	person_id	name	membership_start_date	membership_status
0	NL318	65076	Everette Koepke	20170926	gold
1	AOE21	39426	Noe Locascio	20171005	regular
2	2PN28	63823	Jeromy Heitschmidt	20180215	silver
3	0YJ24	80651	Waneta Wellard	20171206	gold
4	3A08L	32858	Mei Bianchin	20170401	silver

```
get_fit_now_check_in= pd.read_sql_query("SELECT * FROM get_fit_now_check_in",conn)
get_fit_now_check_in.head()
```

	membership_id	check_in_date	check_in_time	check_out_time
0	NL318	20180212	329	365
1	NL318	20170811	469	920
2	NL318	20180429	506	554
3	NL318	20180128	124	759
4	NL318	20171027	418	1019

```
income= pd.read_sql_query("SELECT * FROM income",conn)
income.head()
```

	ssn	annual_income
0	100009868	52200
1	100169584	64500
2	100300433	74400
3	100355733	35900
4	100366269	73000

```
solution= pd.read_sql_query("SELECT * FROM solution",conn)
solution.head()
```

	user	value

Retrieve Crime Scene Report and check the date Jan.15, 2018, in SQL City.

```
crime_scene_report=pd.read_sql_query('''SELECT * FROM crime_scene_report
                                    WHERE date=20180115 and
                                    type='murder' and
                                    city='SQL City';''',conn)
crime_scene_report
```

	date	type	description	city
0	20180115	murder	Security footage shows that there were 2 witnesses. The first witness lives at the last house on "Northwestern Dr". The second witness, named Annabel, lives somewhere on	SQL City

- Security footage shows that there were 2 witnesses. The first witness lives at the last house on "Northwestern Dr". The second witness, named Annabel, lives somewhere on "Franklin Ave".
- By Reading discription of crime scene report had on 15 janury 2018 there were 2 witenesess

```
person1 = pd.read_sql_query('''SELECT *
                            FROM person
                            WHERE address_street_name = 'Northwestern Dr'
                            ORDER BY address_number
                            DESC LIMIT 1''',conn)
person1
```

	id	name	license_id	address_number	address_street_name	ssn
0	14887	Morty Schapiro	118009	4919	Northwestern Dr	111564949

```
person2 = pd.read_sql_query('''SELECT *
                            FROM person
                            WHERE address_street_name = 'Franklin Ave' and name LIKE 'Annabel%'
                            ORDER BY address_number DESC''',conn)
person2
```

	id	name	license_id	address_number	address_street_name	ssn
0	16371	Annabel Miller	490173	103	Franklin Ave	318771143

Witness Found

- First person is Morty Schapiro which has id 14887
- Second person is Annabel Miller which has id 16371

```
interview= pd.read_sql_query('''SELECT *
                            FROM interview
                            WHERE person_id = 16371 or person_id = 14887''',conn)
interview.head()
```

	person_id	transcript
0	14887	I heard a gunshot and then saw a man run out. He had a "Get Fit Now Gym" bag. The membership number on the bag started with "48Z". Only gold members have those bags. The man got into a car with a plate that included "H42W".

After reading transcript we can say that murder had

- "Get Fit Now Gym" bag
- Gold Member of "Get Fit Now Gym" which has id like "48Z"
- Number of car like "H42W"
- Murder date january 9th

Double-click (or enter) to edit

```
# checking gold membership and id LIKE '48Z'
# and checking date january 9th
que = pd.read_sql_query('''SELECT a.id , a.person_id, a.name, a.membership_start_date, a.membership_status, b.check_in_date
                        FROM get_fit_now_member AS a
                        INNER JOIN get_fit_now_check_in as b
                        ON a.id = b.membership_id

                        WHERE membership_status = 'gold' and
                        id LIKE '48Z%'
                            ''',conn)
que
```

	id	person_id	name	membership_start_date	membership_status	check_in_date
0	48Z7A	28819	Joe Germuska	20160305	gold	20180109
1	48Z55	67318	Jeremy Bowers	20160101	gold	20180109

Inner Joinning the person, drivers_license and get_fit_now_member tables

for finding murderer using above clues

```
que2 = pd.read_sql_query('''SELECT p.id, p.name, p.license_id, p.address_street_name, dl.gender, dl.plate_number, gtn.membership_status
                        FROM person as p
                        INNER JOIN drivers_license as dl
                        ON p.license_id = dl.id
                        INNER JOIN get_fit_now_member as gtn
                        ON p.id = gtn.person_id
                        WHERE plate_number LIKE '%H42W%' and
                        gender = 'male'
                            ''',conn)
que2
```

	id	name	license_id	address_street_name	gender	plate_number	membership_s
0	67318	Jeremy	423327	Washington Pl, Apt 3A	male	0H42W2	

Muderer Found!!!

```
#verifying murderer
verify = pd.read_sql_query("INSERT INTO solution VALUES (1, 'Jeremy Bowers')", conn)


sol = pd.read_sql_query("SELECT * FROM solution",conn)
sol
```

	user	value
0	0	Congrats, you found the murderer! But wait, there's more... If you think you're up for a challenge, try querying the interview transcript of the murderer to find the real villain behind this crime. If you feel especially confident in your SQL skills, try to complete this final step with no more than 2 queries. Use this same INSERT

Finally!!!

murderer found but there is twist, behind murderer there is a master mind

Finding Master Mind

```
# After interviewing the murderer we found some clue about master mind
interview= pd.read_sql_query('''SELECT *
                            FROM interview
                            WHERE person_id='67318' ''',conn)
interview.head()
```

	person_id	transcript
0	67318	I was hired by a woman with a lot of money. I don't know her name but I know she's around 5'5" (65") or 5'7" (67"). She has red hair and she drives a Tesla Model S. I know that she attended the SQL Symphony Concert 3 times in

Clue is-

I was hired by a woman with a lot of money. I don't know her name but I know she's around 5'5" (65") or 5'7" (67"). She has red hair and she drives a Tesla Model S. I know that she attended the SQL Symphony Concert 3 times in December 2017.

- **Gender - Female**
- **Height - 65 or 67**
- **Hair color - red**
- **Car - Tesla Model s**
- **Attended the SQL Symphony Concert 3 times in December 2017**

```
drivers_license = pd.read_sql_query('''SELECT *
                                FROM drivers_license
                                WHERE gender = 'female' and
                                hair_color = 'red' and
                                car_make = 'Tesla' and
                                car_model = 'Model S' and
                                height BETWEEN 65 AND 67

                                ''', conn)
drivers_license.head()
```

	id	age	height	eye_color	hair_color	gender	plate_number	car_make	car_mo
0	202298	68	66	green	red	female	500123	Tesla	Mode
1	291182	65	66	blue	red	female	08CM64	Tesla	Mode
2	918773	48	65	black	red	female	917UU3	Tesla	Mode

According to clue master mind Attended the SQL Symphony Concert 3 times in December 2017

```
facebook_event_checkin= pd.read_sql_query('''SELECT *
                                    FROM facebook_event_checkin
                                    WHERE date like '201712%'
                                    ''',conn)
facebook_event_checkin.head()
```

	person_id	event_id	event_name	date
0	31811	8542	-- Herbert Prochnow\n	20171203
1	41421	3799	And everywhere this language went,\n	20171206
2	66493	816	Just because your doctor has a name for your condition doesn't mean he\n	20171211
3	96520	8784	Good advice is something a man gives when he is too old to set a bad\n	20171218

Inner Joinning person, drivers_license, facebook_event_checkin tables.

considerring above clues

```
final = pd.read_sql_query('''SELECT p.id,p.name, dl.height, dl.hair_color, dl.gender, dl.car_make, dl.car_model, fec.event_name, fec.date
                        FROM person as p
                        INNER JOIN drivers_license as dl
                        ON p.license_id = dl.id
                        INNER JOIN facebook_event_checkin as fec
                        ON p.id = fec.person_id
                        WHERE gender = 'female' and
```

```
                    hair_color = 'red' and
                    car_make = 'Tesla' and
                    car_model = 'Model S' and
                    height BETWEEN 65 AND 67 and
                    date like '201712%'

                        ''',conn)
final
```

	id	name	height	hair_color	gender	car_make	car_model	event_name	da
0	99716	Miranda Priestly	66	red	female	Tesla	Model S	SQL Symphony Concert	201712

Master Mind Found!!!!

her name is "Miranda Priestly"

```
# Checking the master mind
result = pd.read_sql_query("INSERT INTO solution VALUES (1, 'Miranda Priestly')",conn)
result
```

Congrats, Master Mind Found.....

```
result2=pd.read_sql_query("SELECT * FROM solution",conn)
result2
```

	user	value
0	0	Congrats, you found the brains behind the murder! Everyone in SQL City hails you as the greatest SQL detective of all time. Time to break out the champagne!