SQL DETECTIVE CHALLENGE - WEEK 5

MURDER MYSTERY INVESTIGATION

The Setup

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.

We've been provided with three crucial details: a murder occurred, the date being January 15, 2018, and the location as SQL City. Yet, before delving into querying to uncover the perpetrator, it's essential to gain a deeper understanding of the SQLite database's structure.

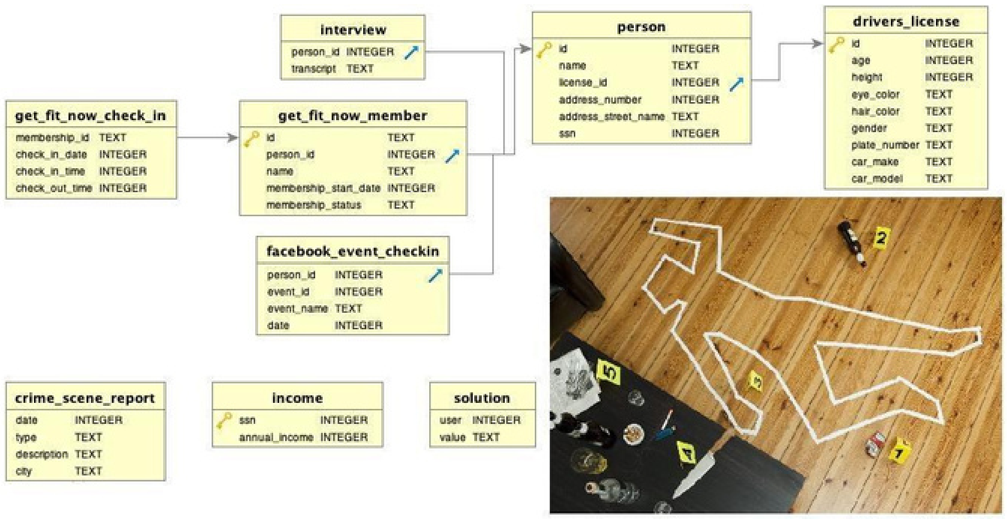


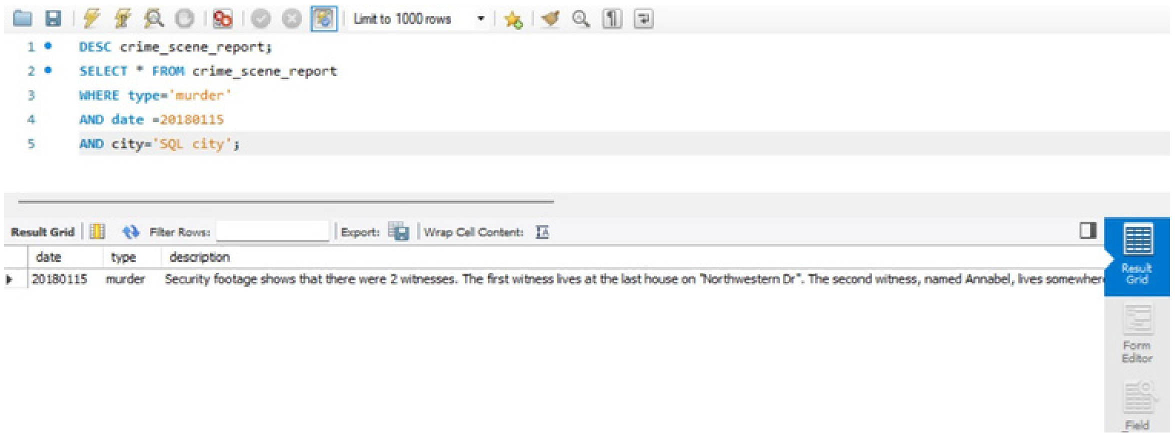
Fig 1. Schema Diagram

Investigation Process:

We're prepared to initiate our formal investigation. Our initial action: examining the crime scene report!

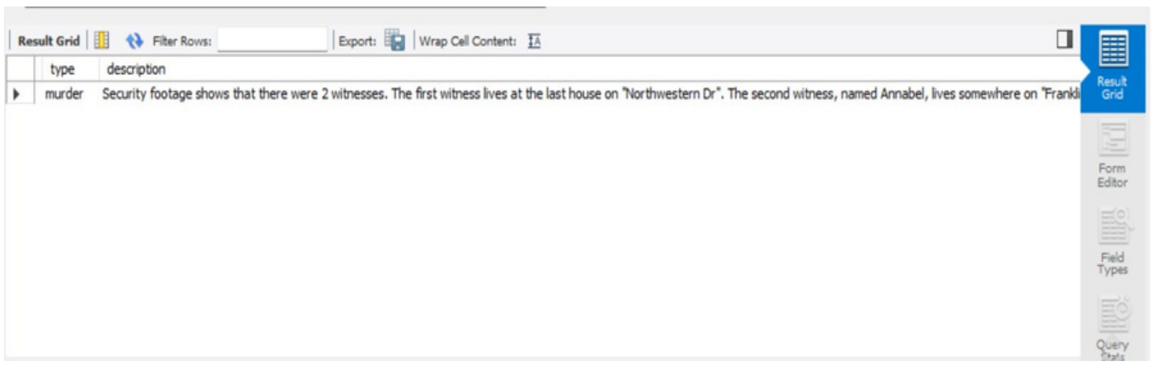
Crime Scene Report

Considering the structure of the 'crime_scene_report' table, our focus lies in extracting the description of the crime. Fortunately, armed with the date, type, and city of the crime, we can effectively filter the data to obtain relevant and valuable information.



```sql
DESC crime_scene_report;
SELECT * FROM crime_scene_report
WHERE type='murder'
AND date =20180115
AND city='SQL city';
```

```
date      type    description
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 somewher
```



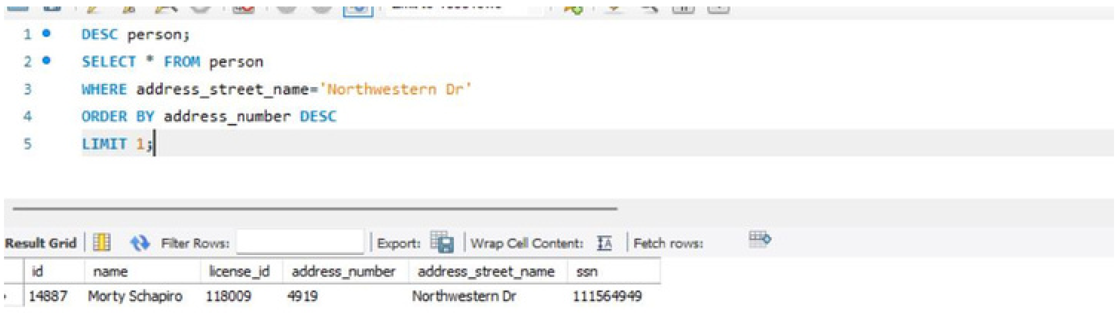
```
type    description
murder  Security footage shows that there were 2 witnesses. The first witness lives at the last house on "Northwestern Dr". The second witness, named Annabel, lives somewhere on "Franki
```

The crime scene report has been located! It's revealed that we need to locate two witnesses: one residing at the final residence on Northwestern Dr, and another named Annabel, situated on Franklin Avenue. Our subsequent action involves examining these witnesses' interviews to gather insights into what they observed.

Witness Personal Details

Using the structure of the interview table, we require the person_id of our witnesses to access their transcripts. As per the schema, the person_id aligns with the 'id' field in the person table, which contains details like names and addresses.

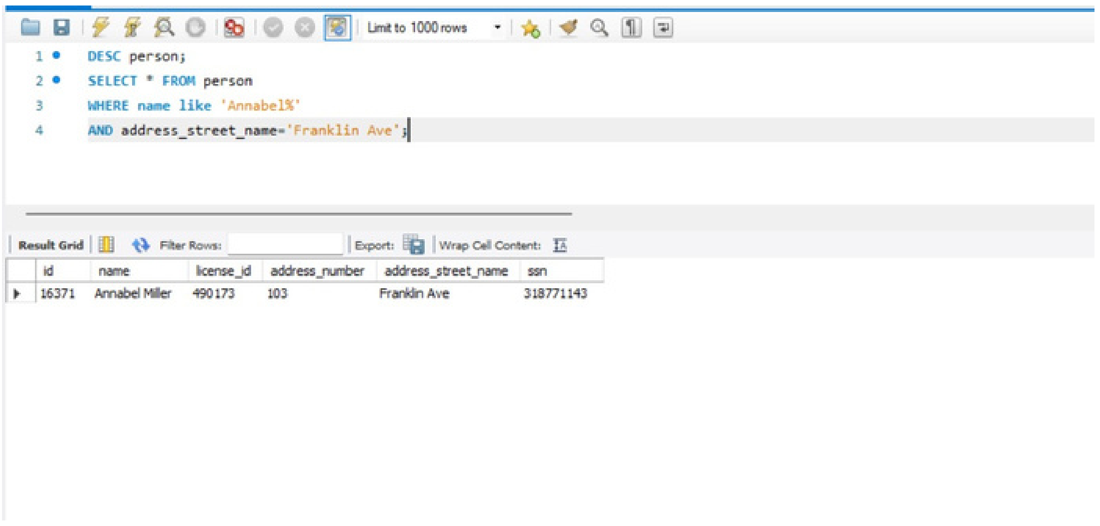
First Witness living at the last house on “Northwestern Dr”



```
DESC person;
SELECT * FROM person
WHERE address_street_name='Northwestern Dr'
ORDER BY address_number DESC
LIMIT 1;
```

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

Second witness (Annabel) and lives in Franklin Ave:



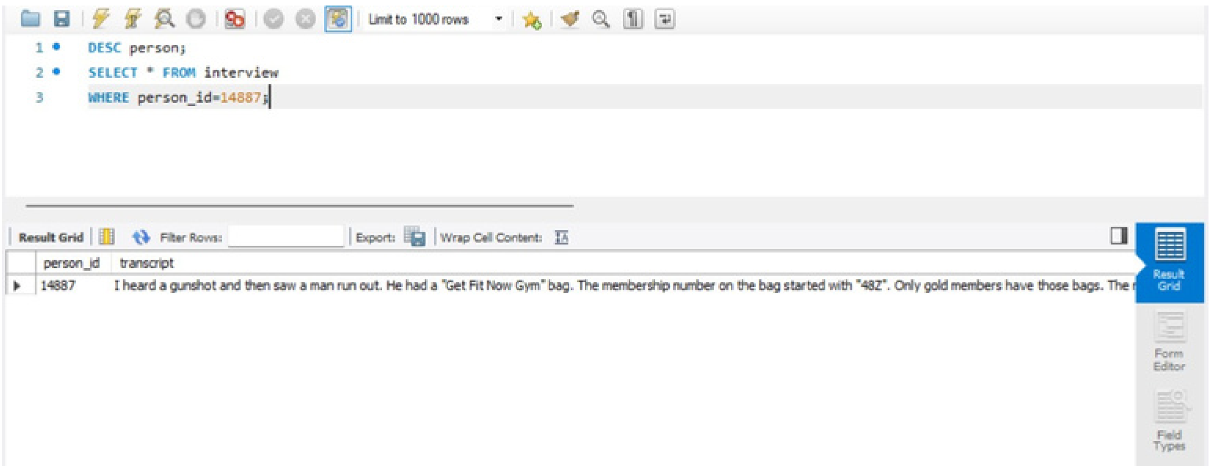
```
DESC person;
SELECT * FROM person
WHERE name like 'Annabel%'
AND address_street_name='Franklin Ave';
```

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

Now that we have the ids of the witnesses, we can look for the interview transcripts.

Witness Interviews:

First witness Interview

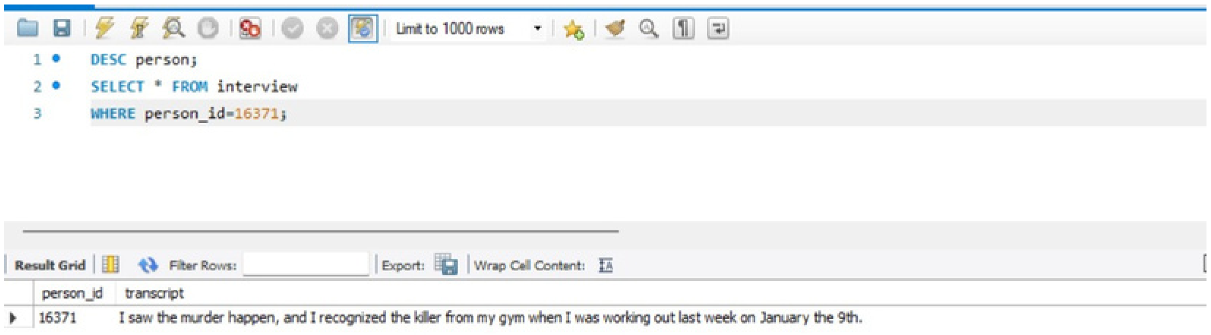


```
DESC person;
SELECT * FROM interview
WHERE person_id=14887;
```

person_id	transcript
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

This query solidifies that the culprit is indeed a gym member, specifically a gold member. Morty further provides crucial details: a gun as the murder weapon, a partial membership number ('48Z'), a license plate ('H42W'), and confirms the gender of the killer as male. The investigation is pointing us toward the gym as a pivotal lead in our pursuit.

Second Witness Interview:



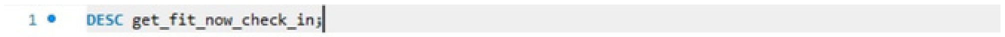
```
DESC person;
SELECT * FROM interview
WHERE person_id=16371;
```

```
person_id  transcript
16371      I saw the murder happen, and I recognized the killer from my gym when I was working out last week on January the 9th.
```

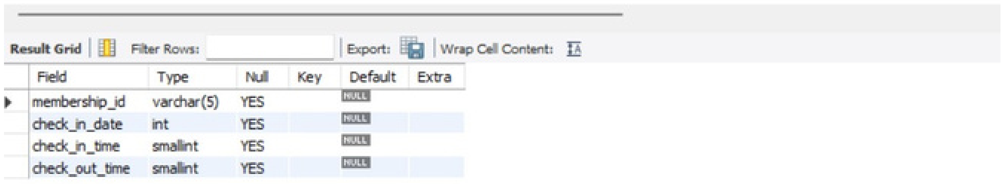
From this query, we can know that Annabel was an eyewitness to the murder. Additionally, she identified the perpetrator as a gym member who visited on January 9, 2018.

Gym Members

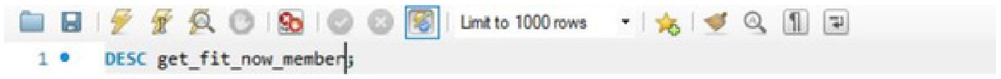
By merging Annabel's gym check-in date with Morty's partial gym membership ID and membership status, we anticipate acquiring the complete membership ID of the perpetrator. Subsequently, matching this ID to a name will allow us to identify the individual associated with it.



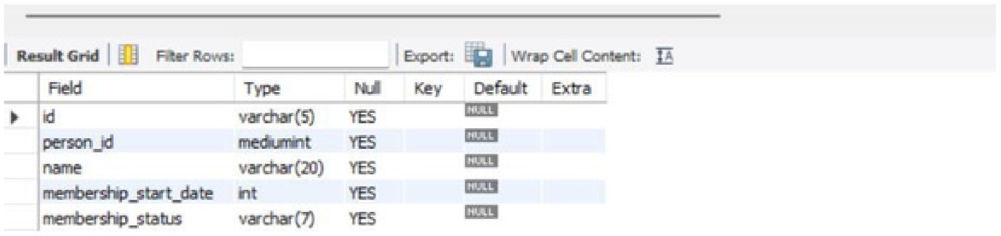
```sql
DESC get_fit_now_check_in;
```



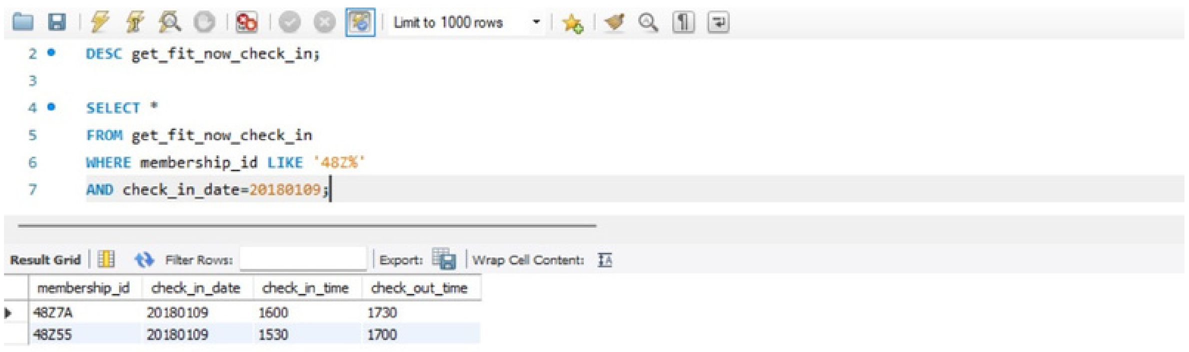
Field	Type	Null	Key	Default	Extra
membership_id	varchar(5)	YES		NULL	
check_in_date	int	YES		NULL	
check_in_time	smallint	YES		NULL	
check_out_time	smallint	YES		NULL	



```sql
DESC get_fit_now_member;
```



Field	Type	Null	Key	Default	Extra
id	varchar(5)	YES		NULL	
person_id	mediumint	YES		NULL	
name	varchar(20)	YES		NULL	
membership_start_date	int	YES		NULL	
membership_status	varchar(7)	YES		NULL	



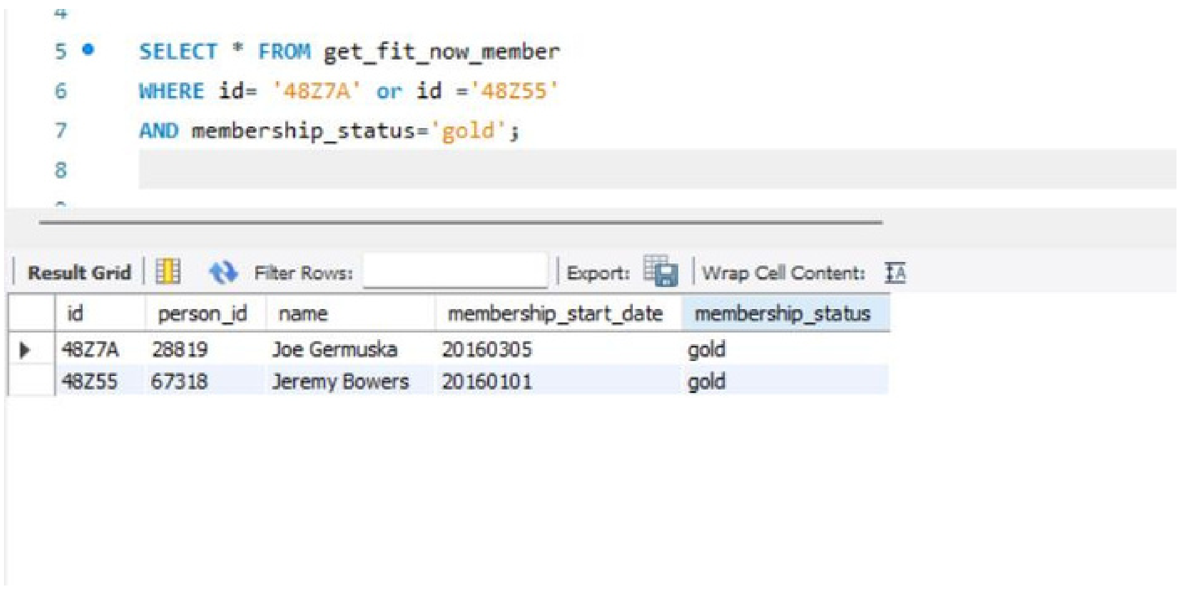
```
DESC get_fit_now_check_in;

SELECT *
FROM get_fit_now_check_in
WHERE membership_id LIKE '48Z%'
AND check_in_date=20180109;
```

Limit to 1000 rows

Result Grid | Filter Rows: | Export: | Wrap Cell Content:

membership_id	check_in_date	check_in_time	check_out_time
48Z7A	20180109	1600	1730
48Z55	20180109	1530	1700

On January 9th, two members possessing IDs beginning with '48Z' were present for check-in. Utilizing data from the 'get_fit_now_member' table, we can refine our selection of potential suspects based on this information.



```
SELECT * FROM get_fit_now_member
WHERE id= '48Z7A' or id ='48Z55'
AND membership_status='gold';
```

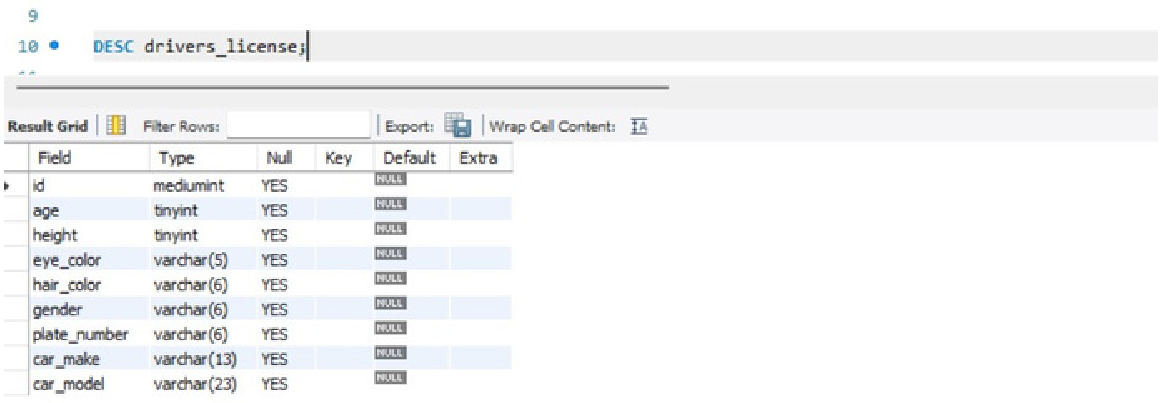
Result Grid | Filter Rows: | Export: | Wrap Cell Content:

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

Both potential suspects hold gold membership status, making it impossible to discern the perpetrator based solely on their membership status. Nevertheless, we've now identified them as Joe Germuska and Jeremy Bowers. We can leverage this information to retrieve their license plate details and cross-reference them to determine if either aligns with Morty's description.

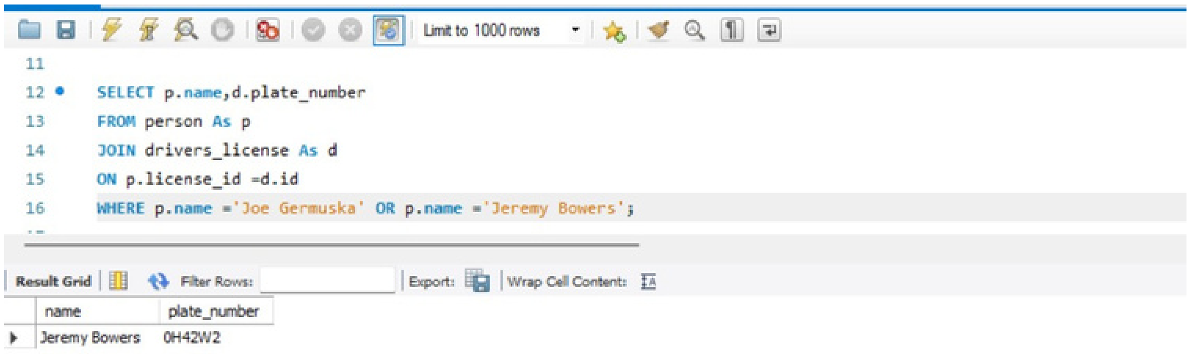
Car Details

We'll utilize the person table to correlate the names with their respective license ID numbers. These license ID numbers can then serve as identifiers within the drivers_license table, allowing us to retrieve the associated license plate numbers.



```
DESC drivers_license;
```

Field	Type	Null	Key	Default	Extra
id	mediumint	YES		NULL	
age	tinyint	YES		NULL	
height	tinyint	YES		NULL	
eye_color	varchar(5)	YES		NULL	
hair_color	varchar(6)	YES		NULL	
gender	varchar(6)	YES		NULL	
plate_number	varchar(6)	YES		NULL	
car_make	varchar(13)	YES		NULL	
car_model	varchar(23)	YES		NULL	

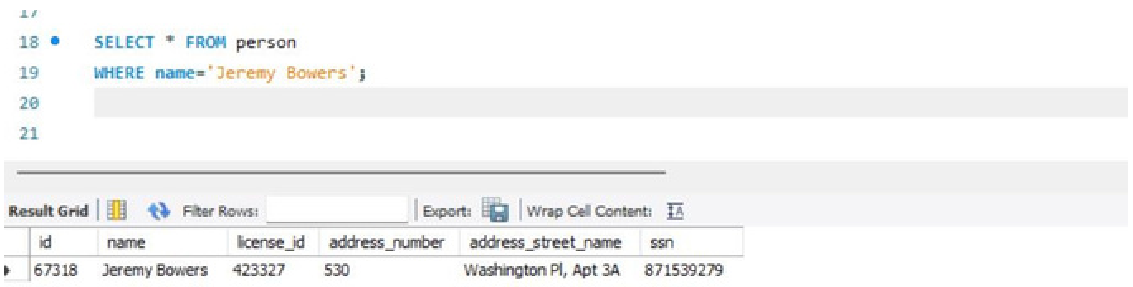


```sql
SELECT p.name,d.plate_number
FROM person As p
JOIN drivers_license As d
ON p.license_id =d.id
WHERE p.name ='Joe Germuska' OR p.name ='Jeremy Bowers';
```

name	plate_number
Jeremy Bowers	0H42W2

It appears that among the individuals investigated, only Jeremy Bowers possesses a registered car, and his license plate aligns with Morty's description. Consequently, we've identified our culprit as Jeremy Bowers!

Personal Details of the culprit

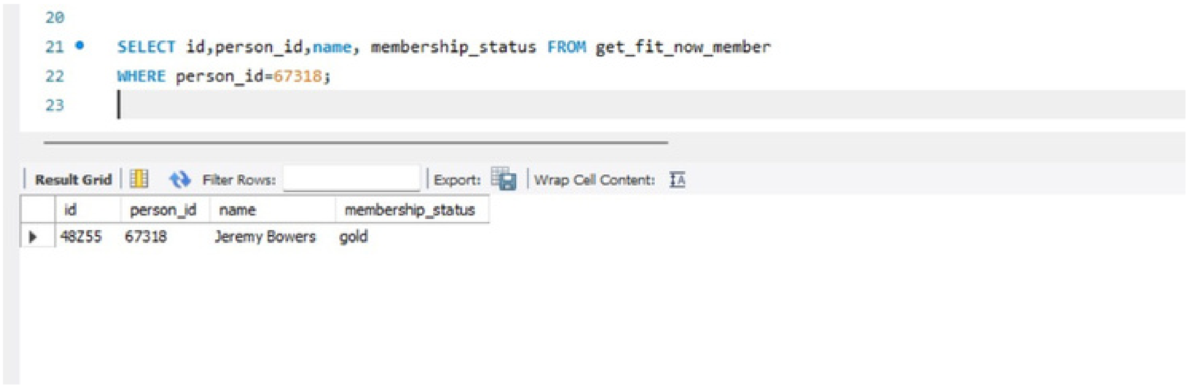


```sql
SELECT * FROM person
WHERE name='Jeremy Bowers';
```

id	name	license_id	address_number	address_street_name	ssn
67318	Jeremy Bowers	423327	530	Washington Pl, Apt 3A	871539279

Using the id we can confirm the Membership status of the culprit using the get_fit_now_member table.

Membership Status at GYM:



```sql
SELECT id,person_id,name, membership_status FROM get_fit_now_member
WHERE person_id=67318;
```

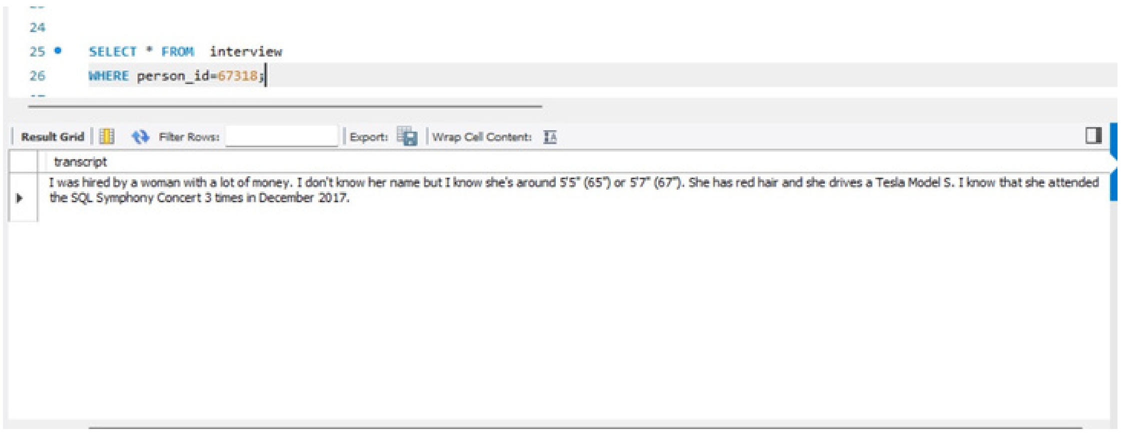
Result Grid | Filter Rows: | Export: | Wrap Cell Content:

id	person_id	name	membership_status
48Z55	67318	Jeremy Bowers	gold

Yes ,the membership status of the culprit matches ‘gold’ as mentioned by one of the witnesses

The Mastermind Orchestrating the Actions of the Murderer

It appears that our perpetrator might have been operating under someone's directives. Let's delve into Jeremy Bowers' testimony to gain insights. With the information obtained from our gym membership query, we possess Jeremy Bowers' person_id: 67318, which should enable us to retrieve his interview transcript.

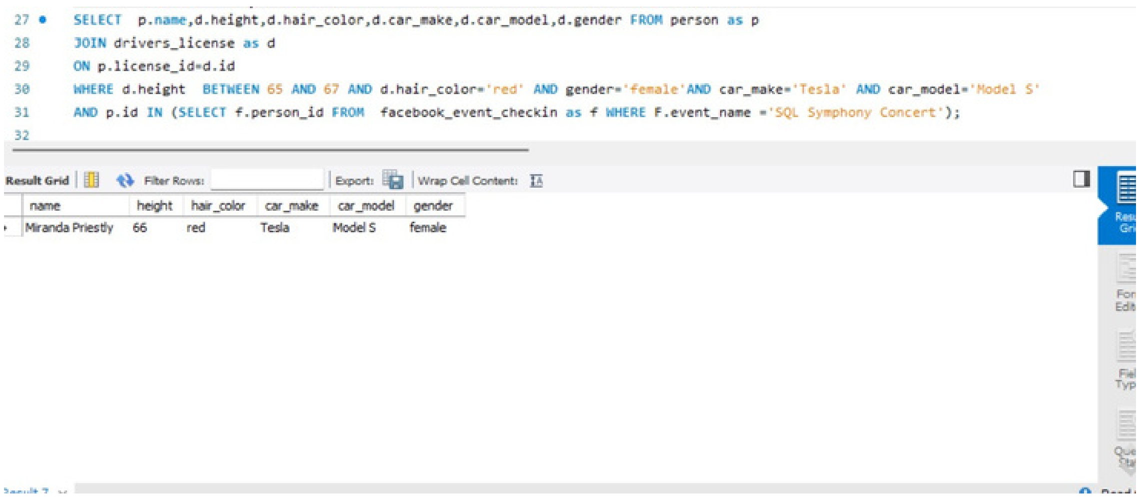


```sql
SELECT * FROM interview
WHERE person_id=67318;
```

Result Grid | Filter Rows: | Export: | Wrap Cell Content:

transcript
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.

Jeremy has provided significant details about his boss. She's described as a female, standing between 65" and 67" tall, possessing red hair, and owning a Tesla Model S. Furthermore, she's noted to have attended the SQL Symphony Concert three times during December 2017.



```sql
SELECT  p.name,d.height,d.hair_color,d.car_make,d.car_model,d.gender FROM person as p
JOIN drivers_license as d
ON p.license_id=d.id
WHERE d.height  BETWEEN 65 AND 67 AND d.hair_color='red' AND gender='female'AND car_make='Tesla' AND car_model='Model S'
AND p.id IN (SELECT f.person_id FROM  facebook_event_checkin as f WHERE F.event_name ='SQL Symphony Concert');
```

name	height	hair_color	car_make	car_model	gender
Miranda Priestly	66	red	Tesla	Model S	female

Success! We've identified our malevolent mastermind: Miranda Priestly. With this revelation, our investigation reaches its conclusion.