Basic SQL

SQL MURDER MYSTERY

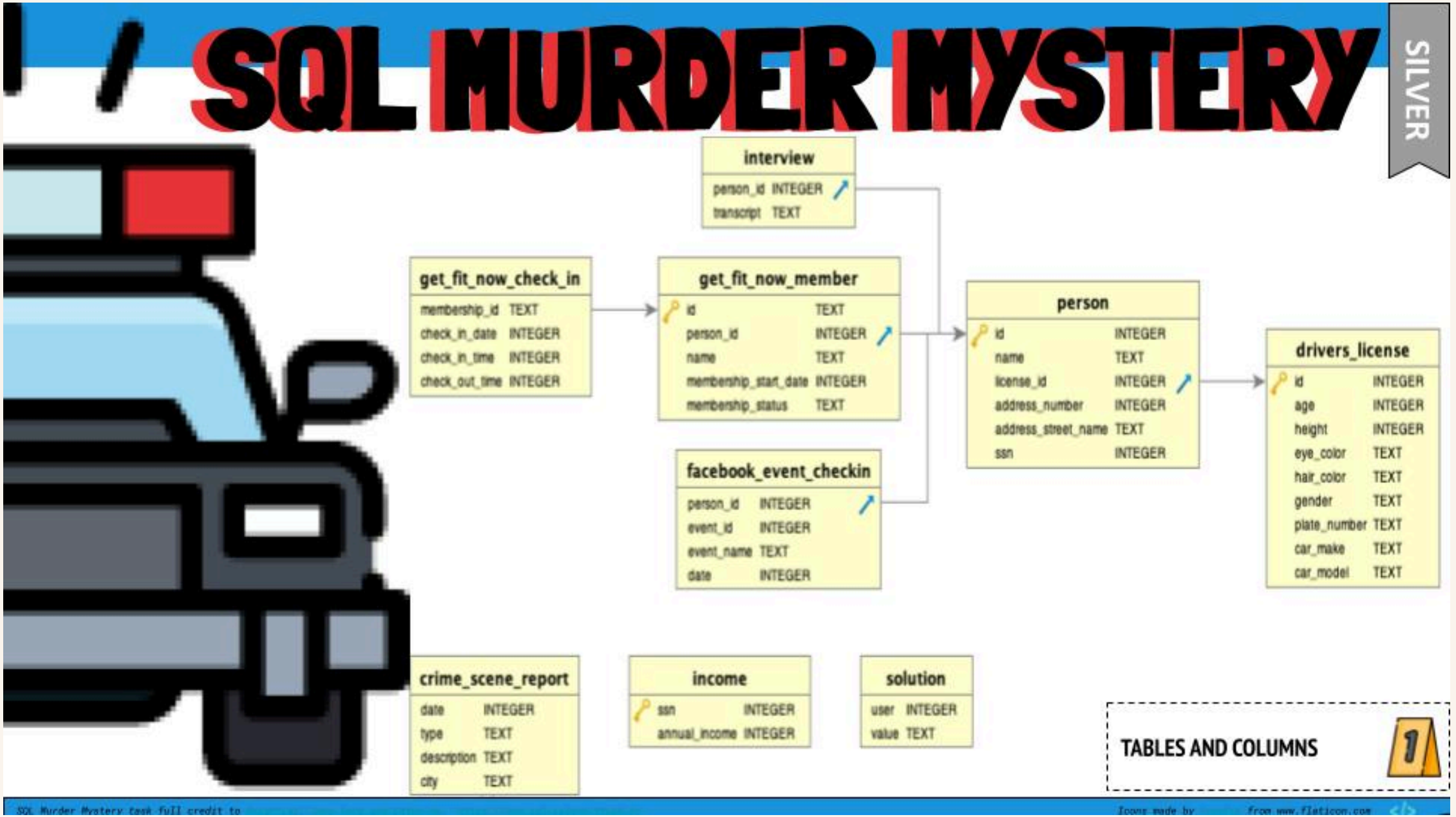
SILVER

FIRST CLUE...

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.

All the clues to this mystery are buried in a huge database, and you need to use SQL to navigate through this vast network of information. Your first step to solving the mystery is to retrieve the corresponding crime scene report from the police department's database.


SQL MURDER MYSTERY
SILVER
interview
person_id INTEGER
transcript TEXT
get_fit_now_check_in
membership_id TEXT
check_in_date INTEGER
check_in_time INTEGER
check_out_time INTEGER
get_fit_now_member
id TEXT
person_id INTEGER
name TEXT
membership_start_date INTEGER
membership_status TEXT
person
id INTEGER
name TEXT
license_id INTEGER
address_number INTEGER
address_street_name TEXT
ssn INTEGER
drivers_license
id INTEGER
age INTEGER
height INTEGER
eye_color TEXT
hair_color TEXT
gender TEXT
plate_number TEXT
car_make TEXT
car_model TEXT
facebook_event_checkin
person_id INTEGER
event_id INTEGER
event_name TEXT
date INTEGER
crime_scene_report
date INTEGER
type TEXT
description TEXT
city TEXT
income
ssn INTEGER
annual_income INTEGER
solution
user INTEGER
value TEXT
TABLES AND COLUMNS
1

To Write a Query:

1. Which `table`?
2. Which `columns`?
3. Which `rows`?

First clue

> 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.

`SELECT` columns `FROM` a table `WHERE` conditions are true

Table: crime_scene_report

Columns: all

Rows: report type is murder

```
SELECT * FROM crime_scene_report WHERE type = 'murder';
```

Comparison operators

- `=`
- `!=`
- `>=`

...

Logical operators

- `NOT`
- `AND`
- `OR`

Membership operators

- `IN`
- `NOT IN`

`SELECT` all non-murder cases

```sql
-- using !=
SELECT * FROM crime_scene_report WHERE type != 'murder';
-- using not
SELECT * FROM crime_scene_report WHERE NOT type = 'murder';
```

Multiple matching criteria (`AND`, `OR`)

Table: crime_scene_report

Columns: all

Rows: a murder that occurred sometime on Jan.15, 2018 and that it took place in SQL City.

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

Crime report

```
SELECT *
FROM crime_scene_report
WHERE type = 'murder'
AND date = 20180115
AND city = '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".

Matching

Table: person

Columns: all

Rows: lives at the last house on "Northwestern Dr"

```
SELECT *
FROM person
WHERE address_street_name = 'northwestern dr'
```

Case-insensitive matching

```
SELECT *
FROM person
WHERE lower(address_street_name) = 'northwestern dr'
```

`ORDER BY` address_number (`DESC` ending order)

Table: person

Columns: all

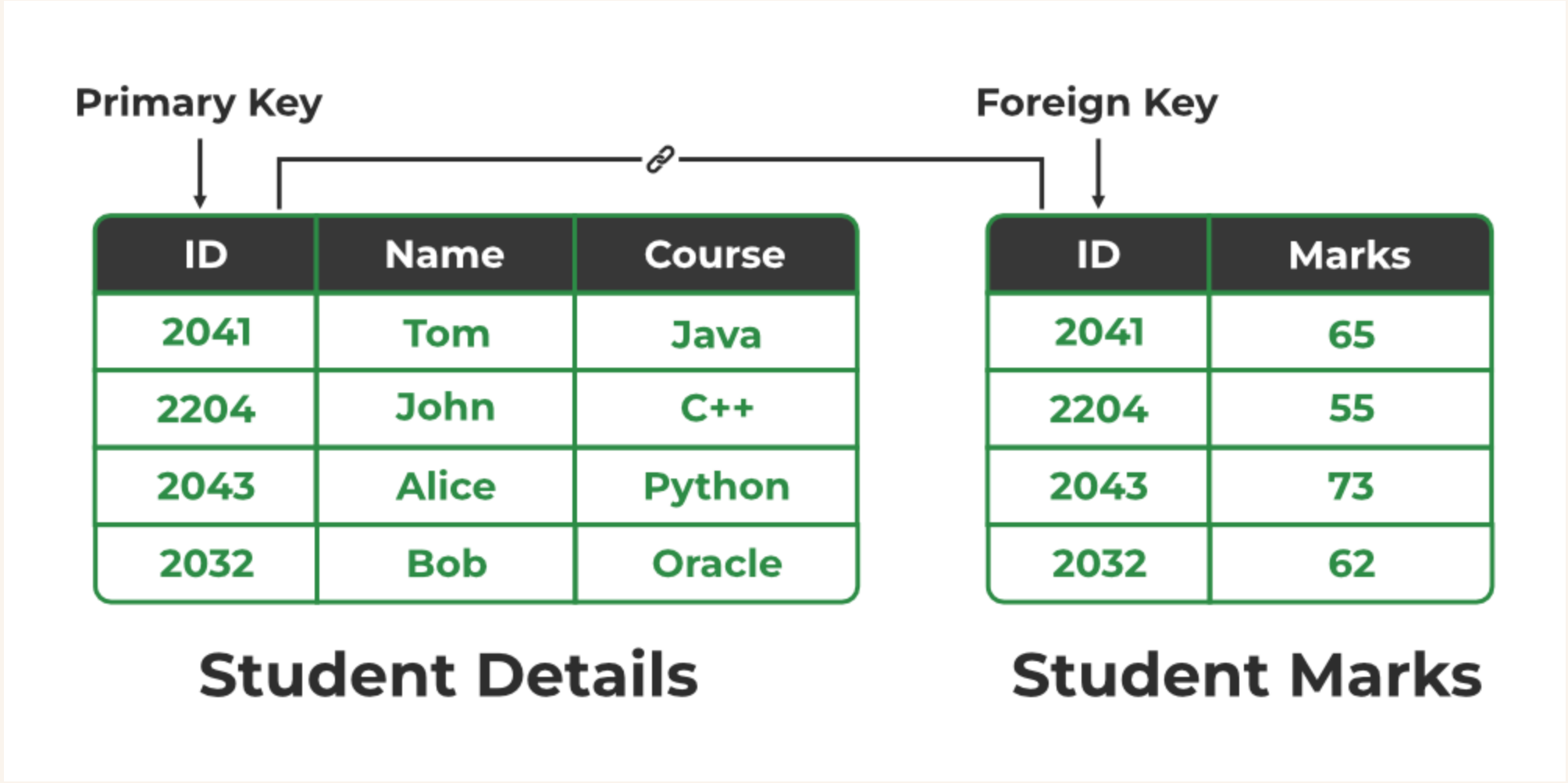
Rows: lives at ***the last house*** on "Northwestern Dr"

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

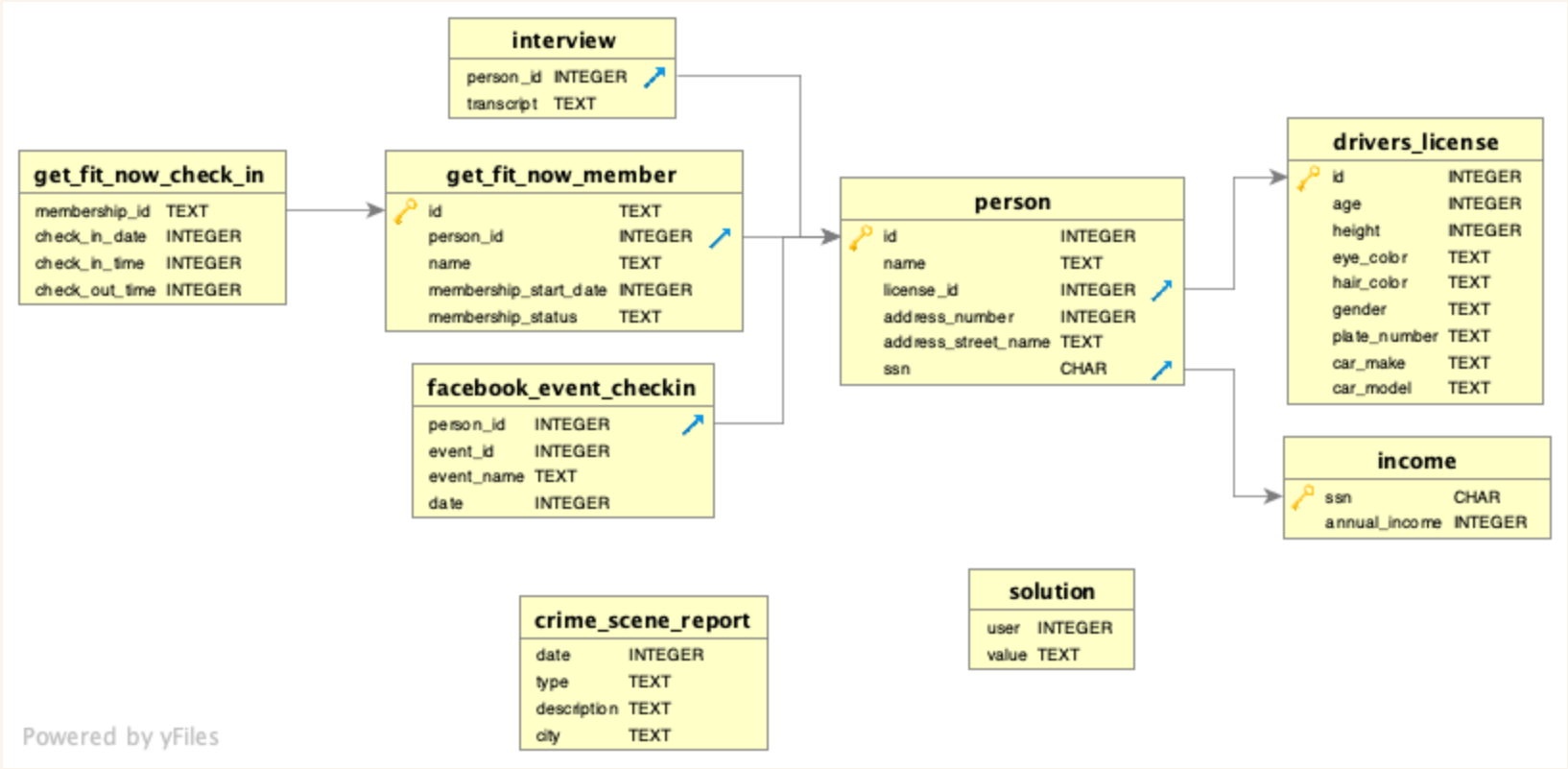
First witness

id	name	license_id	address_number	address_street_name	ssn
14887	Morty Schapiro	118009	4919	Northwestern Dr	1115649

Primary key / Foreign key 🔑



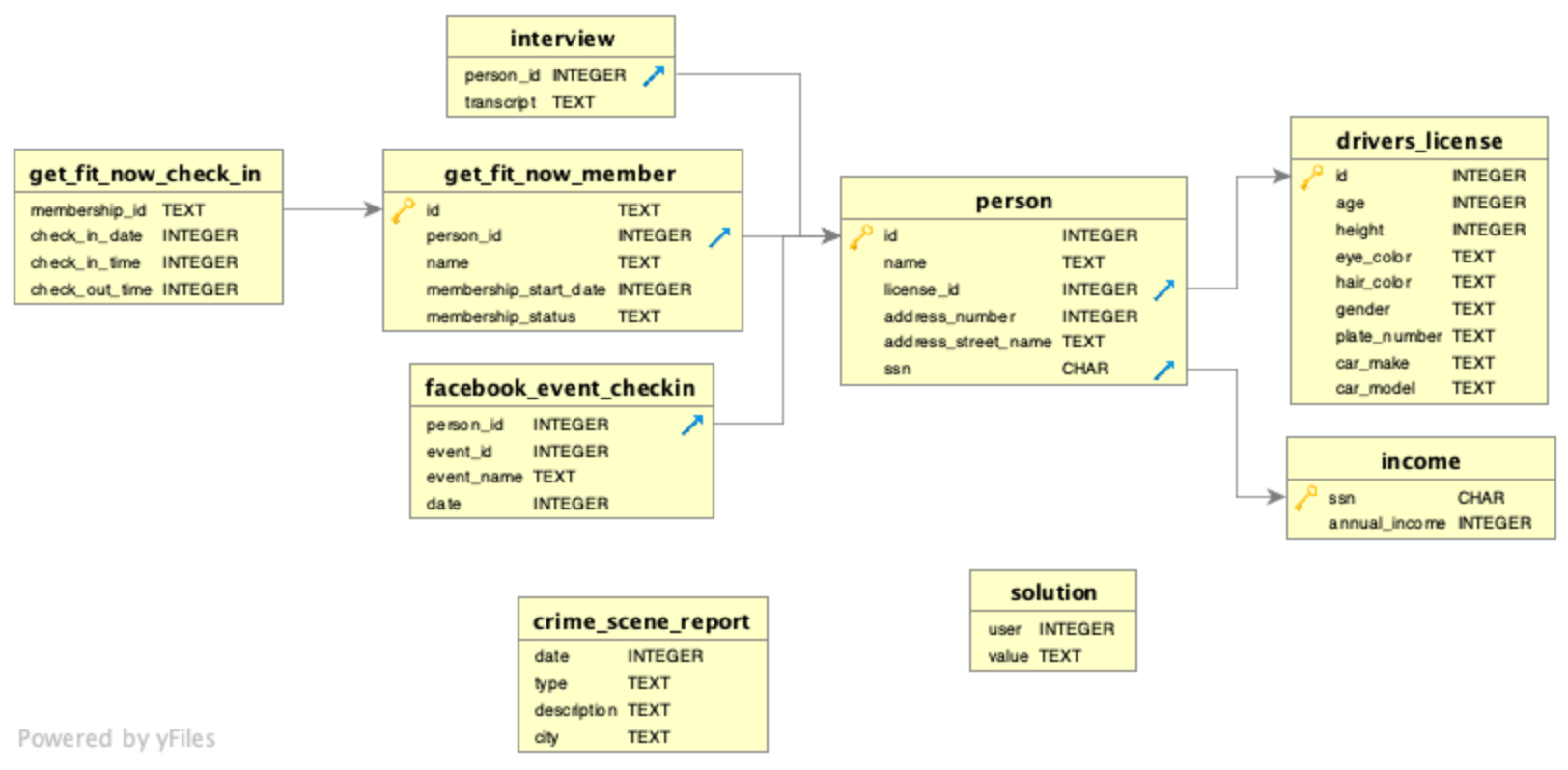
PK and FK of `person` table?



🔑 Primary key: `id`

↗️ Foreign key: `license_id`, `ssn`

Which tables connect to `person` table?



↗ `person_id` in `interview` → 🔑 `id` in `person` table

↗ `person_id` in `facebook_event_checkin` → 🔑 `id` in `person` table

↗ `person_id` in `get_fit_now_member` → 🔑 `id` in `person` table

First witness's interview

```
SELECT * FROM interview WHERE person_id = 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".**

- 1️⃣ Gold member whose id starts with "48Z" from `get_fit_now_member`
- 2️⃣ Driver whose license plate includes "H42W" from `drivers_license`

Pattern matching `LIKE`

- `%`: Any number of characters
- `_`: Only one character

Exact matching

```
-- exact matching
SELECT * FROM get_fit_now_member WHERE id = '48Z'
SELECT * FROM get_fit_now_member WHERE id LIKE '48Z'
```

Pattern matching

Starts with:

```
-- followed by any number of characters
SELECT * FROM get_fit_now_member WHERE id LIKE '48Z%'
-- followed by only one character
SELECT * FROM get_fit_now_member WHERE id LIKE '48Z_'
```

Ends with:

```
-- any number of preceeding characters
SELECT * FROM get_fit_now_member WHERE id LIKE '%48Z'
-- only one preceeding character
SELECT * FROM get_fit_now_member WHERE id LIKE '_48Z'
```

Includes:

```
SELECT * FROM get_fit_now_member WHERE id LIKE '%48Z%'
```

1️⃣ Gold member whose id starts with "48Z" from `get_fit_now_member`

```
SELECT * FROM get_fit_now_member
WHERE id LIKE '48Z%'
AND membership_status='gold'
```

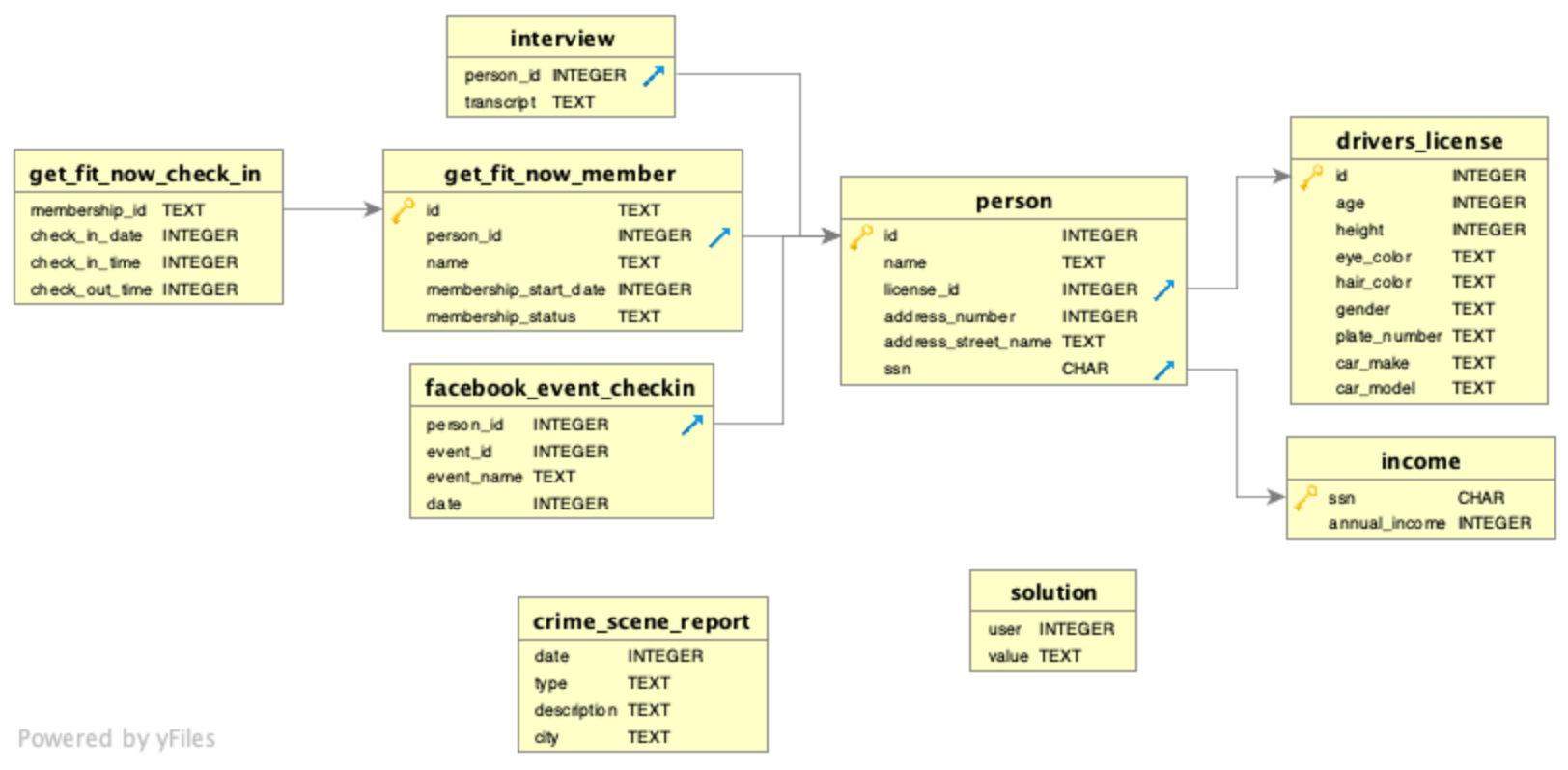
id	person_id	name	membership_start_date	membership_status
48Z55	67318	Jeremy Bowers	20160101	gold
48Z7A	28819	Joe Germuska	20160305	gold

2️⃣ Driver whose license plate includes "H42W" from `drivers_license`

```
SELECT * FROM drivers_license
WHERE plate_number LIKE '%H42W%'
```

id	age	height	eye_color	hair_color	gender	plate_number	car_make
183779	21	65	blue	blonde	female	H42W0X	Toyota
423327	30	70	brown	brown	male	0H42W2	Chevrolet
664760	21	71	black	black	male	4H42WR	Nissan

Relationship between `get_fit_now_member` and `drivers_license`



↗ `person_id` in `get_fit_now_member` → 🔑 `id` in `person` table

↗ `license_id` in `person` → `id` in 🔑 `drivers_license` table

Cross-checking two tables

Using logical operators (`AND` , `OR` , `NOT`)

```
SELECT * FROM person
-- from get_fit_now_member
WHERE (id = 67318 OR id = 28819)
-- from drivers_license
AND (license_id = 183779 OR license_id = 423327 OR license_id = 664760)
```

Using membership operators (`IN` , `NOT IN`)

```
SELECT * FROM person
-- from get_fit_now_member
WHERE id IN (67318, 28819)
-- from drivers_license
AND license_id IN (183779, 423327, 664760)
```

Second witness

```
SELECT *
FROM crime_scene_report
WHERE type = 'murder'
AND date = 20180115
AND city = '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".

To Write a Query:

1. Which `table`?
2. Which `columns`?
3. Which `rows`?

💻 What's the person_id of the second witness?

> The second witness, named Annabel, lives somewhere on "Franklin Ave".

What's on her interview?

💻 Figure out what time she was at the gym

Hint: find her `membership_id` first, then use it to find her check-in time.

💻 Who else was at the gym during the time she was there?

Hint: Anyone who left before she arrived or arrived after she left should be excluded.

BETWEEN, NOT BETWEEN

```
SELECT *
FROM get_fit_now_check_in
WHERE check_out_time BETWEEN 1600 AND 1700
```

```
SELECT *
FROM get_fit_now_check_in
WHERE check_out_time NOT BETWEEN 1600 AND 1700
```

Who are they?

Wrap up

- `SELECT` columns `FROM` a table `WHERE` conditions are true
  - `LIKE` pattern matching
  - `IN` membership operator
  - `BETWEEN` range operator
- `LIMIT` the number of records returned
- `ORDER BY` columns