JOINING JOINS

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ANNOUNCEMENTS

- I will have HW3 feedback to you by tomorrow afternoon
- No homework due this week, because you have a test on Wednesday!
  - You’ll have the full class duration to take it, but it will be written for an hour
  - Pen and paper exam: no computers
  - Study Materials
    - Study guide with some practice questions
    - Old test
    - Solutions to both
- Polling: polling.jedrembold.prof
- Haley here to talk for a moment with you about career development!

REVIEW QUESTION!

Given the two tables and the query below, what would be the output?

events

id	name	att
0	Dinner	0
1	Dinner	1
2	Concert	2
3	Bingo	0

folks

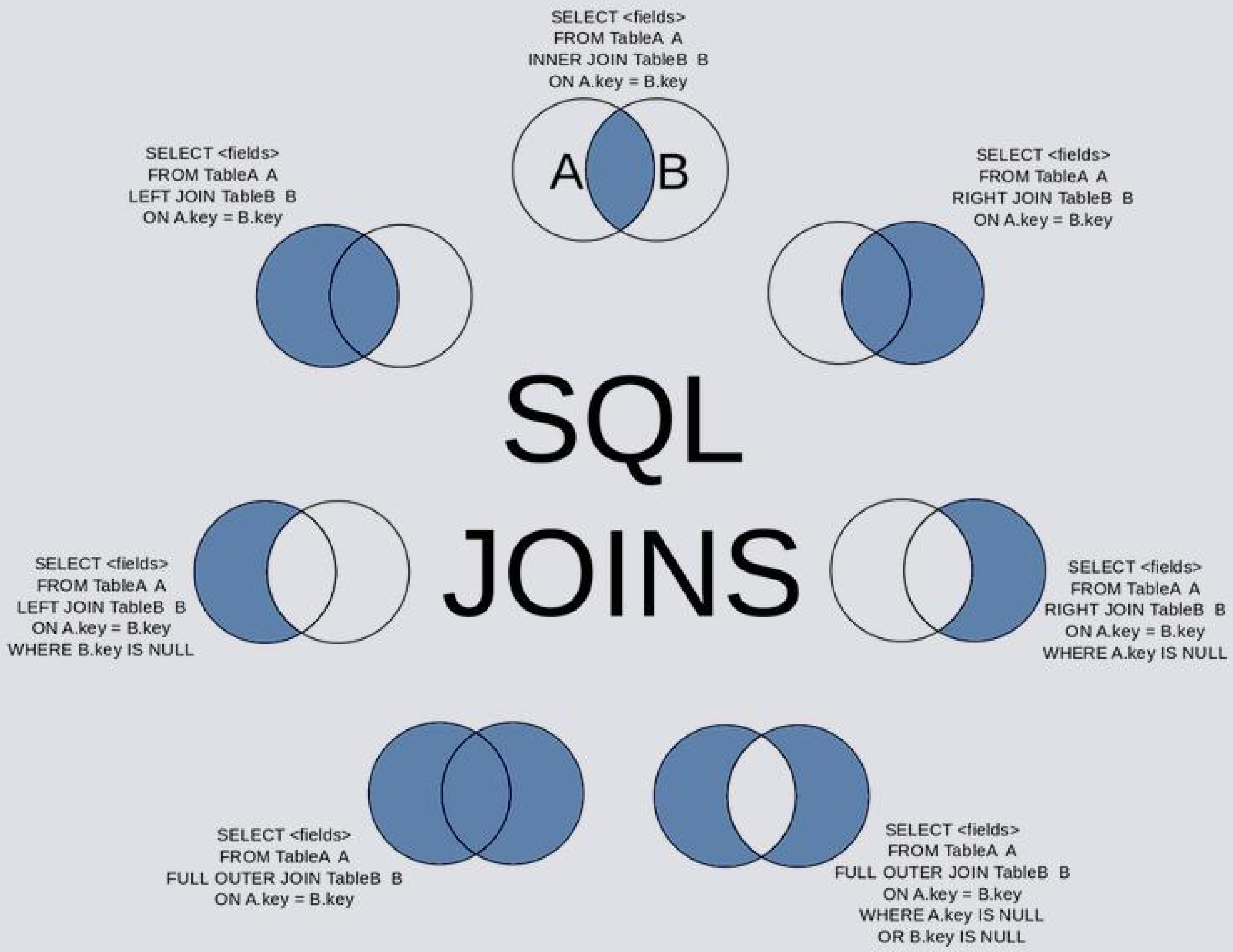
id	name	age
0	Bob	13
1	Jane	16
2	Bill	23
3	Hillary	20

```
SELECT
  COUNT(events.name)
FROM folks
LEFT JOIN events
  ON events.att = folks.id
WHERE age % 2 = 0;
```

A) 0 B) 1 C) 2 D) 3

JOINS AS VENN DIAGRAMS

- Sometimes it may help to think of different types of joins as Venn diagrams



```
SELECT <fields>
FROM TableA A
INNER JOIN TableB B
ON A.key = B.key
```

```
SELECT <fields>
FROM TableA A
LEFT JOIN TableB B
ON A.key = B.key
```

```
SELECT <fields>
FROM TableA A
RIGHT JOIN TableB B
ON A.key = B.key
```

```
SELECT <fields>
FROM TableA A
LEFT JOIN TableB B
ON A.key = B.key
WHERE B.key IS NULL
```

```
SELECT <fields>
FROM TableA A
RIGHT JOIN TableB B
ON A.key = B.key
WHERE A.key IS NULL
```

```
SELECT <fields>
FROM TableA A
FULL OUTER JOIN TableB B
ON A.key = B.key
```

```
SELECT <fields>
FROM TableA A
FULL OUTER JOIN TableB B
ON A.key = B.key
WHERE A.key IS NULL
OR B.key IS NULL
```

COMPOUND JOINS

MULTIPLE JOIN CONDITIONALS

- You are not limited to just a single condition in your `ON` statement!
- You can chain multiple conditions together with `AND` or `OR`, just like with `WHERE`
- Just recall when comparing two rows that ALL the conditions must be true for the data to be included in the joined table

```
SELECT *
FROM table 1
JOIN table 2
ON table 1.column 1 = table 2.column 1
   AND table 1.column 2 > table 2.column 2;
```

WORD OF WARNING

- For inner joins, the output of joining on multiple conditions would look the same as joining on one condition and then filtering out the others using `WHERE`
- For other types of joins though, this isn't necessarily the case!
  - A `LEFT JOIN` would still give you everything in the left table, for instance, along with `NULL` values that a `WHERE` would likely have filtered out
- Main take-away:
  - Join conditions and filtering conditions *are* doing different things, but they may seem interchangeable if you are just using inner joins.

TABLE ALIASES

- Including long table names before each column name when referring to information from two different tables can get tedious
- You can define aliases for table names just like you can for column names!
- Syntax looks just like column aliases, using `AS`
- Can come immediately after you first reference a table name
  - Usually after a `FROM` or `JOIN` statement
- In truth, the `AS` is optional, but I find it helps some with readability

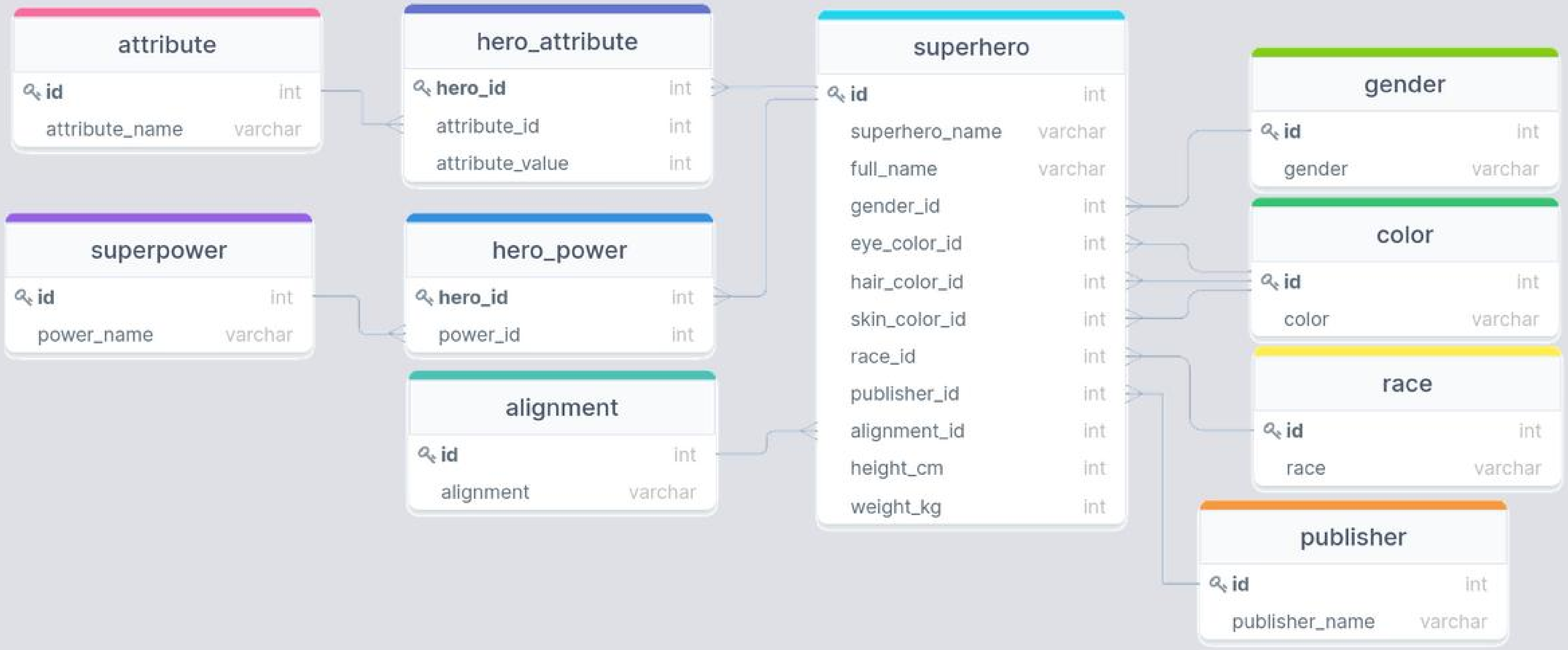
```
SELECT *
FROM tablename AS tn
JOIN tablename2 AS tn2
ON tn.column1 = tn2.column2;
```

MULTIPLE JOINS

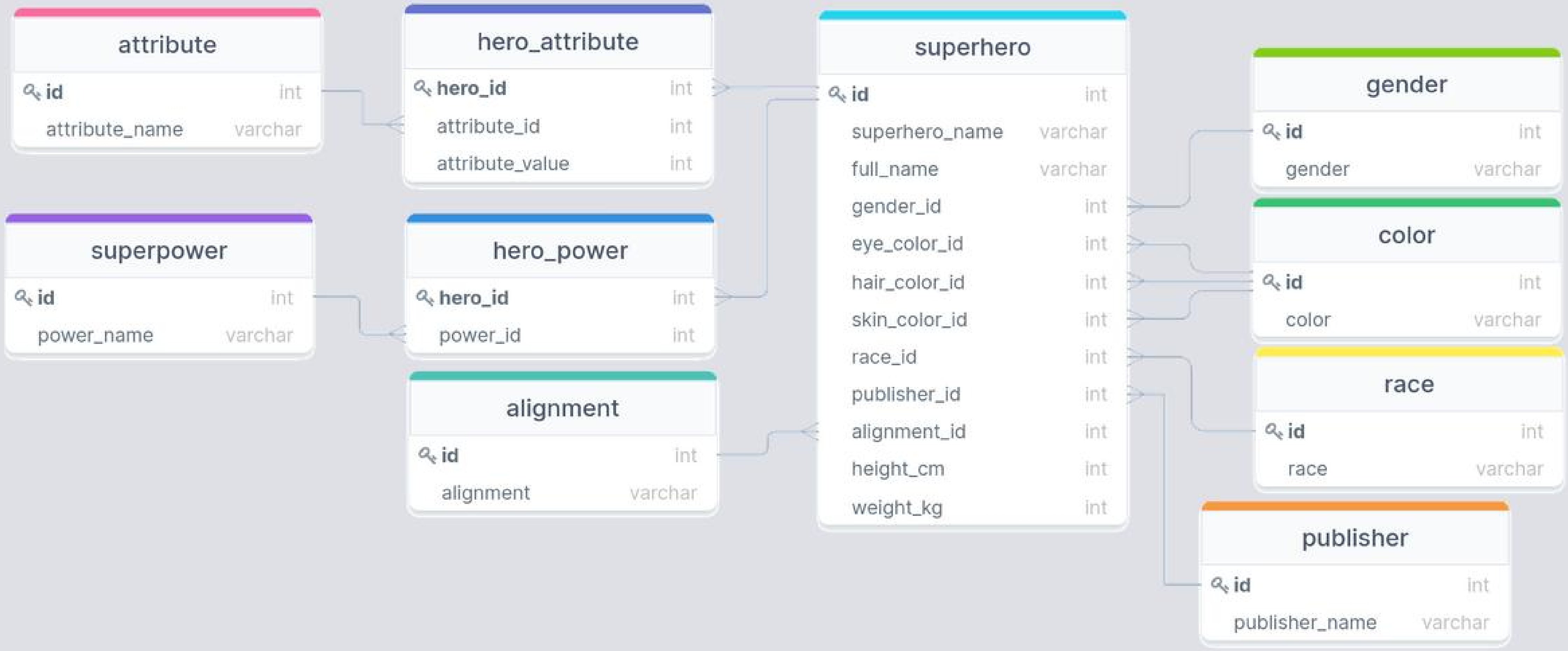
- Nothing stops you from including multiple joins in your query
- Each additional join links back to the current growing joined table
  - This means a second join is treating the entire initial join as the “left” table
  - Be wary that if you join a new table that has multiple columns that could link to existing columns in previously joined tables, you likely want to ensure your join condition matches them all!

```
SELECT *
FROM tablename AS t1
JOIN tablename 2 AS t2 ON t1.column_1 = t2.column_1
JOIN tablename 3 AS t3 ON t1.column_2 = t3.column_1;
```

A SUPER EXAMPLE



A SUPER EXAMPLE



How many blue-eyed superheros can fly?

JOIN THYSELF

SELF JOINS

- You can actually join a table to itself!
- Why would you want to do this?
  - Hierarchy data can frequently be explored in this fashion
  - Comparisons between rows of a table
- You need to give unique aliases when doing this, or else you won't have a way to distinguish between which columns you want

A CORPORATE EXAMPLE

- We have a table containing the names and subordinate relationships between individuals in a corporation.
- What sorts of questions could we answer using just that table and some self joins?

STUDY TIME

THE TIME IS YOURS

- The remainder of our time today is set aside for you to ask questions or work on the study materials