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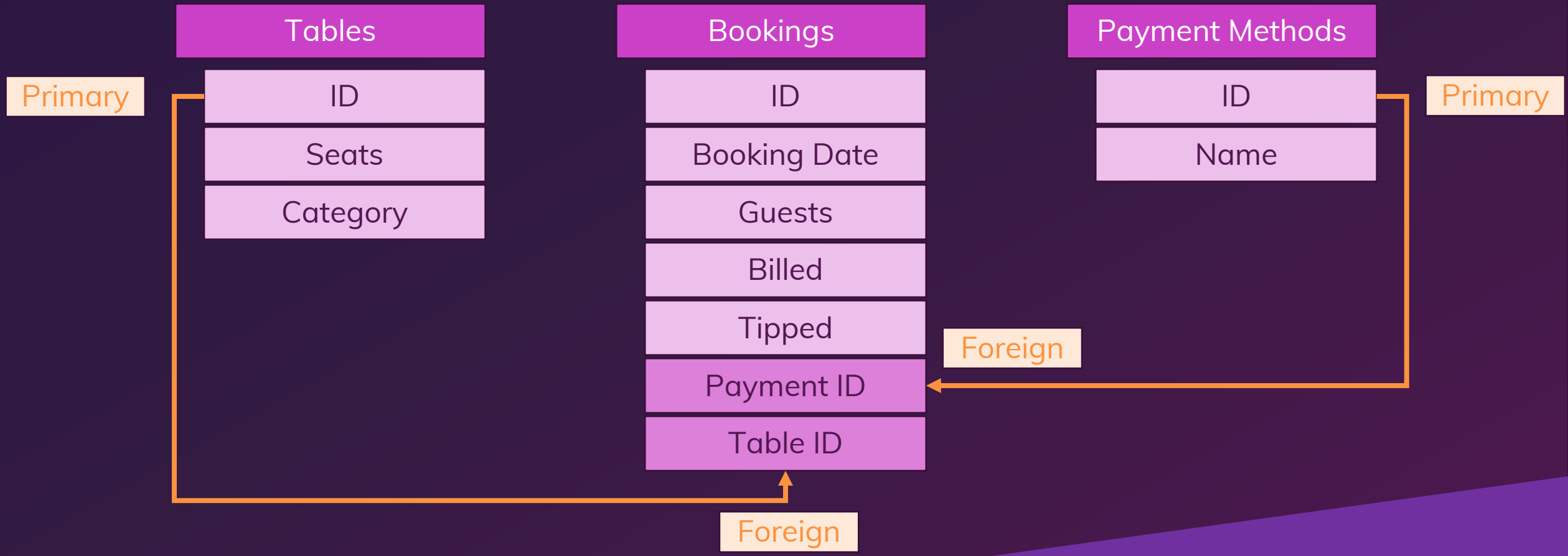
Aggregate Functions & GROUP BY

Diving Into More Advanced Queries

Module Content

- Understanding Aggregate Functions
- Working with GROUP BY & HAVING vs WHERE
- Nested Subqueries & Window Functions

The Module Project - Restaurants



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Terminology

Predefined operation, which can be executed on demand.

```
SELECT SUM(salary) FROM employees;
```

AGGREGATE FUNCTION

Mathematical operation returning a single (aggregated) result.

Core Aggregate Functions Overview

- `COUNT()`
- `SUM()`
- `MAX()`
- `MIN()`
- `AVERAGE()`

Working with two Aggregate Functions as Identifiers

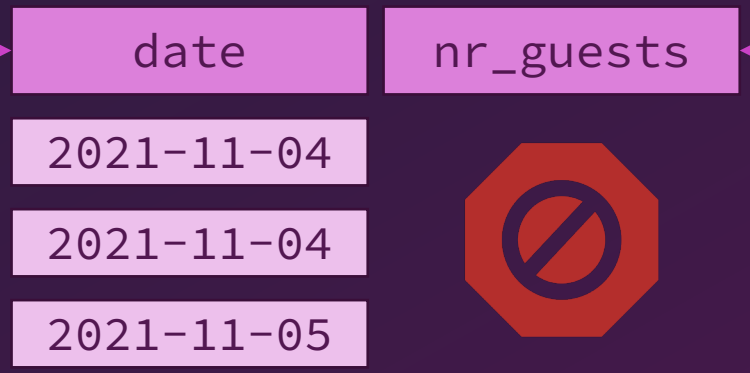
```
SELECT COUNT(booking_date) AS nr_bookings, SUM(nr_guests) AS nr_guests
FROM bookings;
```

nr_bookings	nr_guests
20	76

Aggregates

Aggregated vs Non-Aggregated

```
SELECT booking_date AS date, SUM(nr_guests) AS nr_guests
FROM bookings;
```



GROUP BY to the Rescue!

```
SELECT booking_date AS date, SUM(nr_guests) AS nr_guests
FROM bookings
GROUP BY booking_date;
```

date	nr_guests
2021-11-04	3
2021-11-05	26
2021-11-06	30

Filtering Data with "WHERE"...

WHERE

```
SELECT booking_date, COUNT(booking_date)
FROM bookings
WHERE amount_billed > 30
GROUP BY booking_date;
```

Filter based on single booking

Before GROUP BY

booking_date	amount_billed
2021-11-04	19.90
2021-11-04	12.90
...	...
2021-11-07	26.40
2021-11-07	35.50
2021-11-07	101.90
2021-11-07	130.10

Query Result

booking_date	COUNT(book...)
...	...
2021-11-07	3

Vs "HAVING"

HAVING

```
SELECT booking_date, COUNT(booking_date)
FROM bookings
GROUP BY booking_date
HAVING SUM(amount_billed) > 30;
```

Filter based on calendar day

After GROUP BY

booking_date	amount_billed
2021-11-04	32.80
…	…
2021-11-07	293.90

Query Result

booking_date	COUNT(book…)
2021-11-04	2
…	…
2021-11-07	4

"WHERE" vs "HAVING"

	Filter Applied to	Aggregate Function as Filter Condition Allowed
`WHERE`	Raw Data	✗
VS	↕	↕
`HAVING`	Aggregated Data (`GROUP BY`)	✓

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NESTED SUBQUERIES

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Minimum total amount_billed on single calendar day

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WINDOW FUNCTIONS