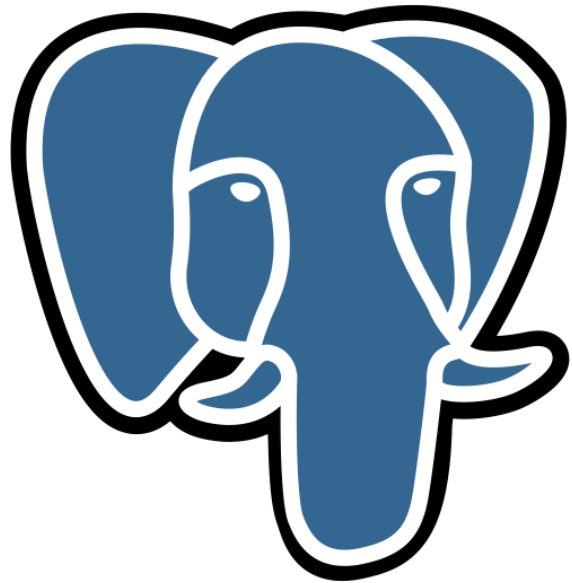




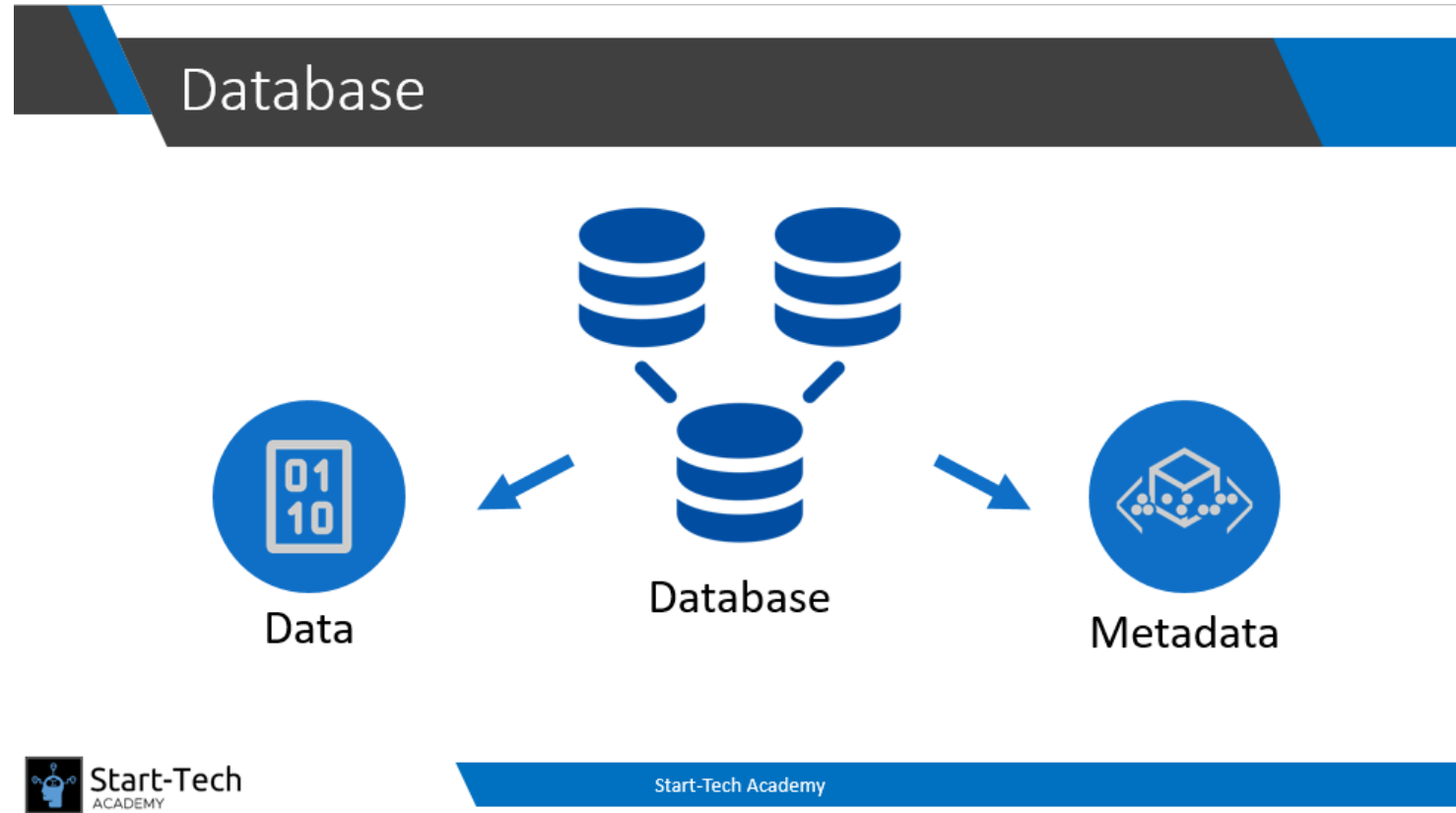
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# The Complete SQL Masterclass For Data Analytics

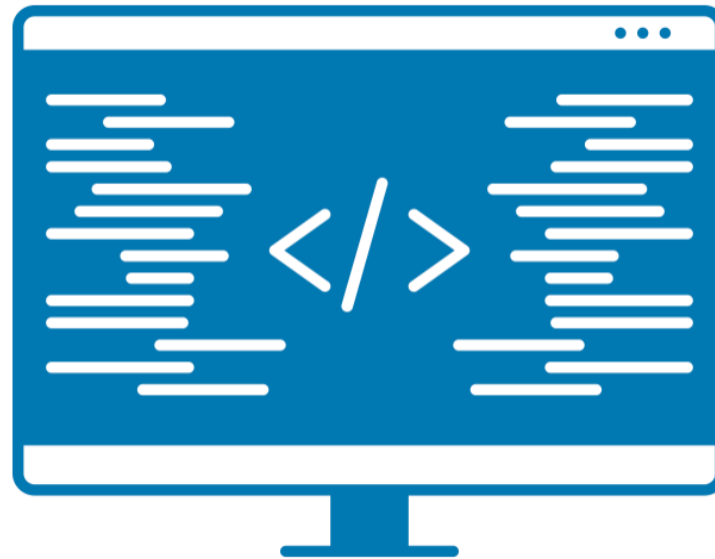
# Basics of Data Management

- ✓ SQL Basics
- ✓ Database Basics
- ✓ SQL Queries



# Fundamental SQL Commands

- ✓ Create
- ✓ Select
- ✓ Insert, Copy
- ✓ Update, Alter



# Data Filtering and Sorting

- ✓ Where command
- ✓ Order By
- ✓ Or, And, Not
- ✓ In, Between, Like

## WILDCARDS

The PostgreSQL LIKE condition allows you to perform pattern matching using Wildcards.

### Example

Wildcard	Explanation
%	Allows you to match any string of any length (including zero length)
_	Allows you to match on a single character

A% means starts with A like ABC or ABCDE

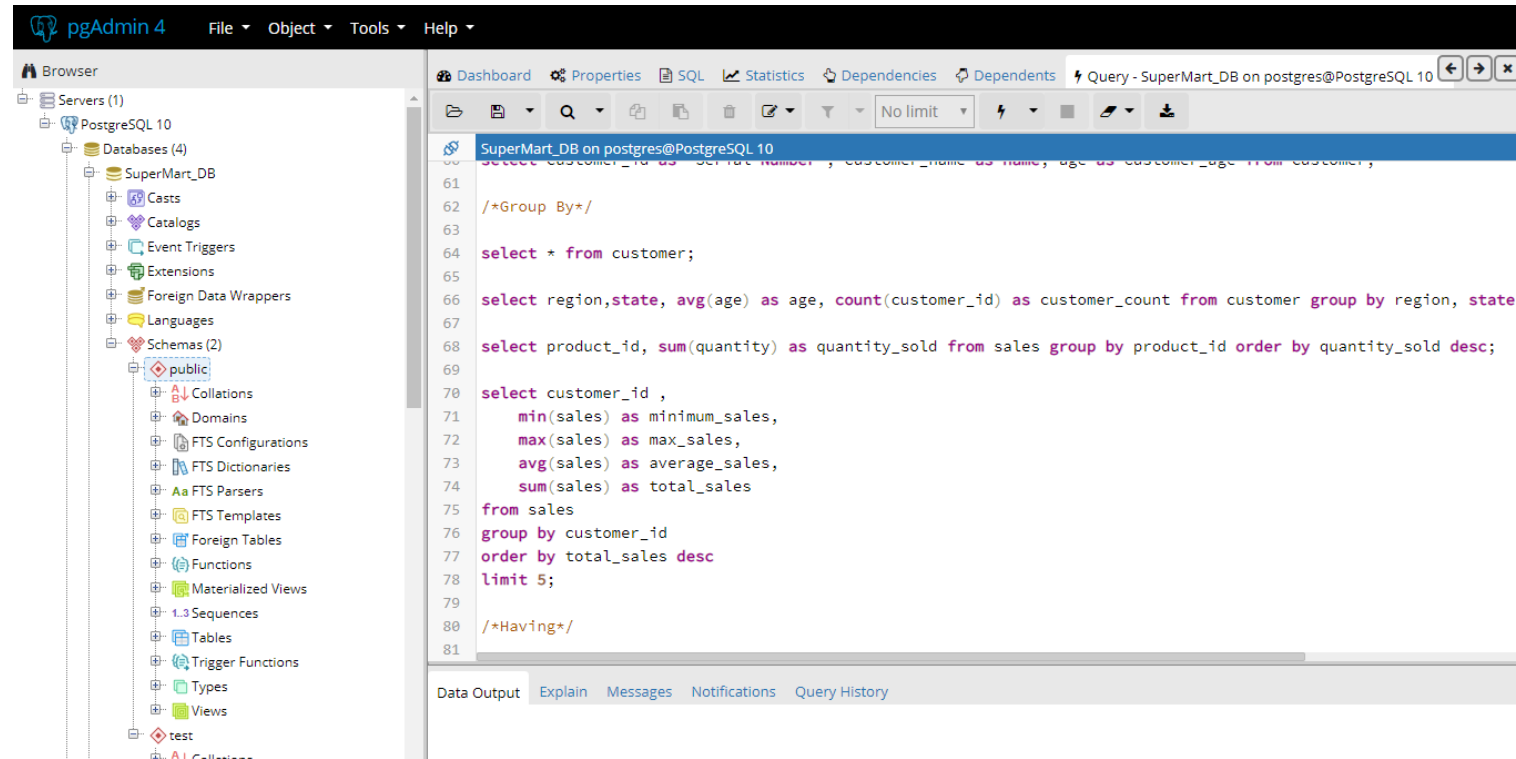
%A means anything that ends with A

A%B means starts with A but ends with B

AB\_C means string starts with AB, then there is one character, then there is C

# Aggregate and Group By commands

- ✓ Sum, Average
- ✓ Count, Min, Max
- ✓ Group By
- ✓ Having



The screenshot shows the pgAdmin 4 interface. On the left, the 'Browser' pane displays the database structure: Servers (1) > PostgreSQL 10 > Databases (4) > SuperMart\_DB > Schemas (2) > public. The main pane shows a SQL query editor with the following code:

```
61 select customer_id, customer_name, age from customer;
62
63 /*Group By*/
64 select * from customer;
65
66 select region,state, avg(age) as age, count(customer_id) as customer_count from customer group by region, state;
67
68 select product_id, sum(quantity) as quantity_sold from sales group by product_id order by quantity_sold desc;
69
70 select customer_id ,
71       min(sales) as minimum_sales,
72       max(sales) as max_sales,
73       avg(sales) as average_sales,
74       sum(sales) as total_sales
75 from sales
76 group by customer_id
77 order by total_sales desc
78 limit 5;
79
80 /*Having*/
81
```

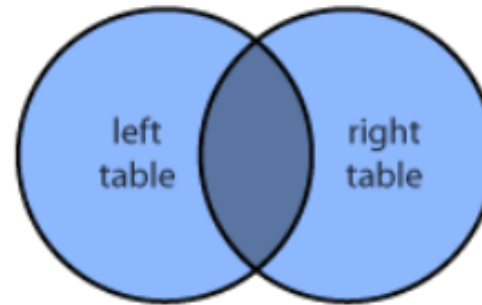
The bottom of the interface shows tabs for 'Data Output', 'Explain', 'Messages', 'Notifications', and 'Query History'.



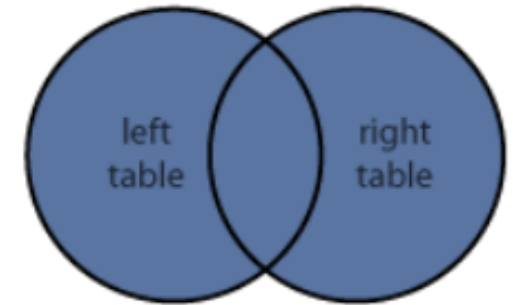
# Joins

- ✓ Inner/Outer join
- ✓ Left/Right Join
- ✓ Cross Join
- ✓ Except & Union

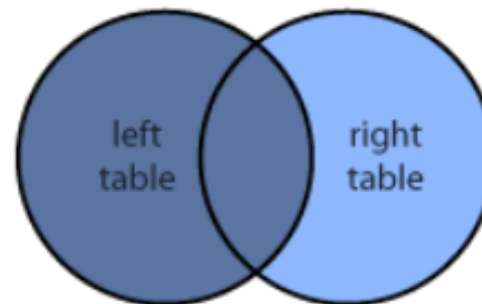
INNER JOIN



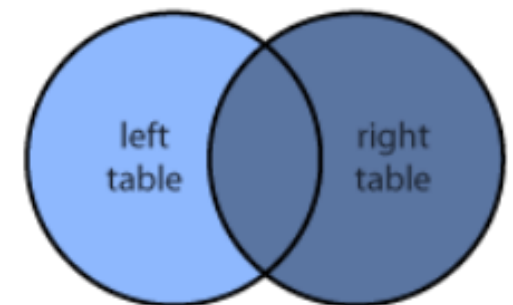
FULL JOIN



LEFT JOIN



RIGHT JOIN



# Advanced Concepts

✓ Subqueries

✓ Views

✓ Indexes

```
223  /* Subquery */
224
225  select * from sales
226  where customer_id in (select customer_id from customer where age > 60);
227
228  select a.product_id,a.product_name,a.category,b.quantity
229  from product as a
230  left join
231      (select product_id, sum(quantity) as quantity from sales group by product_id) as b
232  on a.product_id=b.product_id
233  order by b.quantity desc;
234
235  select customer_id, order_line, (select customer_name from customer where customer.customer_id=
236  from sales
237  order by customer_id;|
238
```



# String Functions

- ✓ Upper Lower
- ✓ TRIM, LTRIM, RTRIM
- ✓ Replace, Substring
- ✓ Concat, String Agg

## TRIM, LTRIM & RTRIM

TRIM function removes all specified characters either from the beginning or the end of a string  
RTRIM function removes all specified characters from the right-hand side of a string  
LTRIM function removes all specified characters from the left-hand side of a string

### Example

```
SELECT trim(leading ' ' from ' Start-Tech Academy ');
```

```
SELECT trim(trailing ' ' from ' Start-Tech Academy ');
```

```
SELECT trim(both ' ' from ' Start-Tech Academy ');
```

```
SELECT trim(' Start-Tech Academy ');
```

```
SELECT rtrim(' Start-Tech Academy ', '');
```

```
SELECT ltrim(' Start-Tech Academy ', '');
```



# Mathematical Functions

- ✓ CEIL & FLOOR
- ✓ Random, Setseed
- ✓ Round
- ✓ Power

## RANDOM

RANDOM function can be used to return a random number between 0 and 1

### Example

Random decimal between a range (a included and b excluded)  
`SELECT RANDOM()*(b-a)+a`

Random Integer between a range (both boundaries included)  
`SELECT FLOOR(RANDOM()*(b-a+1))+a;`

# Date Time Function

- ✓ Current Date
- ✓ Current Time
- ✓ Age
- ✓ Extract

## EXTRACT

EXTRACT function extracts parts from a date

### Units

Unit	Explanation
day	Day of the month (1 to 31)
decade	Year divided by 10
doy	Day of the year (1=first day of year, 365/366=last day of the year, depending if it is a leap year)
epoch	Number of seconds since '1970-01-01 00:00:00 UTC', if date value. Number of seconds in an interval, if interval value
hour	Hour (0 to 23)
minute	Minute (0 to 59)
month	Number for the month (1 to 12), if date value. Number of months (0 to 11), if interval value
second	Seconds (and fractional seconds)
year	Year as 4-digits

# Data Type Conversion Functions

- ✓ Conversion to String
- ✓ Conversion to Date
- ✓ Conversion to Number

## CONVERSION TO STRING

TO\_CHAR function converts a number or date to a string

### Format Mask

Parameter	Explanation
YYYY	4-digit year
MM	Month (01-12; JAN = 01).
Mon	Abbreviated name of month capitalized
Month	Name of month capitalized, padded with blanks to length
DAY	Name of day in all uppercase, padded with blanks to length
Day	Name of day capitalized, padded with blanks to length
DDD	Day of year (1-366)
DD	Day of month (01-31)
HH	Hour of day (01-12)
HH12	Hour of day (01-12)
HH24	Hour of day (00-23)
MI	Minute (00-59)
SS	Second (00-59)
am, AM, pm, or PM	Meridian indicator

# Performance Tuning

- ✓ Explain
- ✓ Tips for String
- ✓ Tips for Joins
- ✓ Query Comparison

## Best Practices

### STRING FUNCTIONS

#### Pattern Matching

- Whenever possible use LIKE statements in place of REGEX expressions
- Do not use 'Similar To' statements, instead use Like and Regex
- Avoid unnecessary string operations such as replace, upper, lower etc

#### String Operations

- Use trim instead of replace whenever possible
- Avoid unnecessary String columns. For eg. Use date formats instead of string for dates

# Pattern Matching

- ✓ Like
- ✓ Similar to
- ✓ ~ (Regular Expressions)

## WILDCARDS

### REG-EX Wildcards

Wildcard	Explanation
	Denotes alternation (either of two alternatives).
*	Denotes repetition of the previous item zero or more times
+	Denotes repetition of the previous item one or more times.
?	Denotes repetition of the previous item zero or one time.
{m}	denotes repetition of the previous item exactly m times.
{m,}	denotes repetition of the previous item m or more times.
{m,n}	denotes repetition of the previous item at least m and not more than n times
^,\$	^ denotes start of the string, \$ denotes end of the string
[chars]	a <i>bracket expression</i> , matching any one of the chars
~*	~ means case sensitive and ~* means case insensitive

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# Bonus lectures

- ✓ Interview tips
- ✓ Keys
- ✓ Access Control
- ✓ Tablespace

