SQL COMPONENTS

Baraa Khatib Salkini
SQL Course | SELECT Query

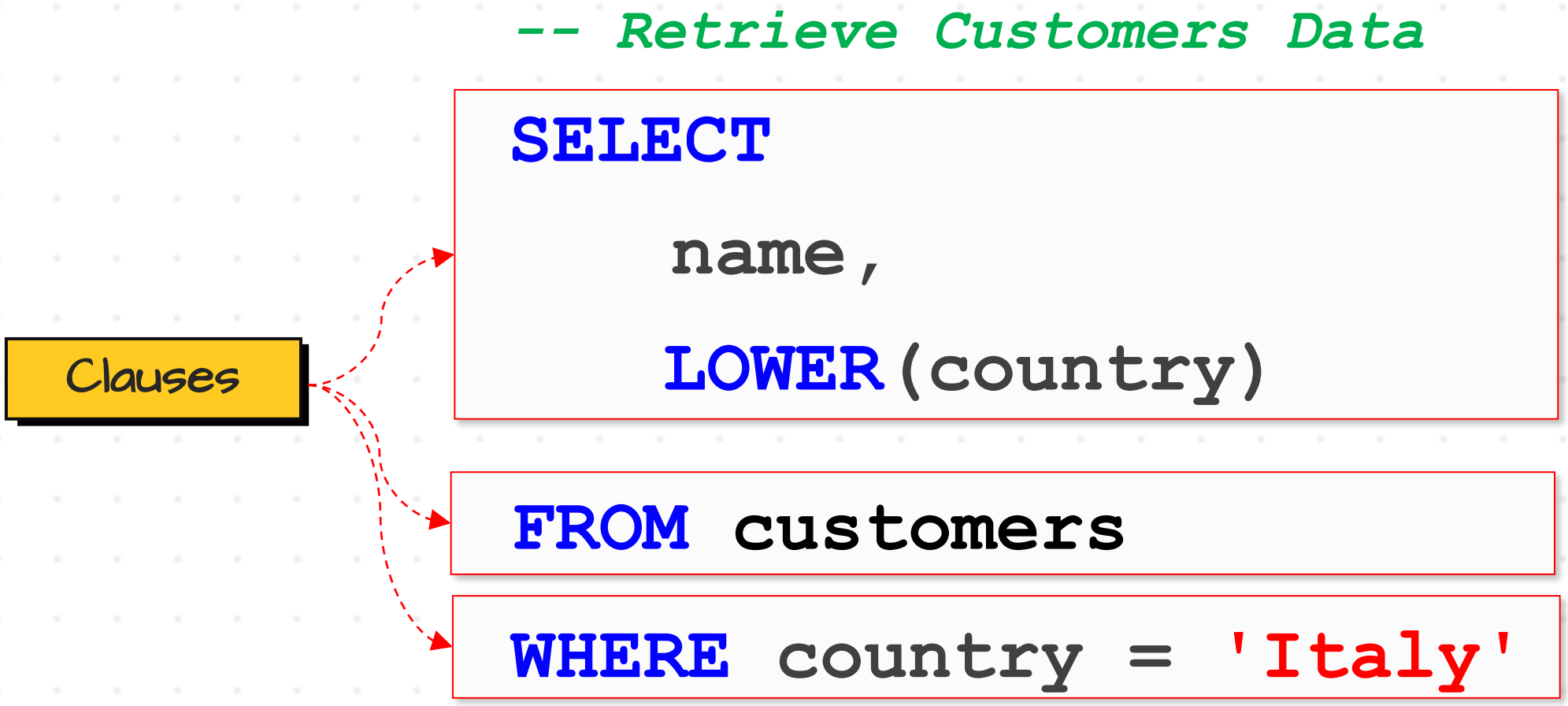
```sql
-- Retrieve Customers Data
SELECT
    name,
    LOWER(country)

FROM customers

WHERE country = 'Italy'
```

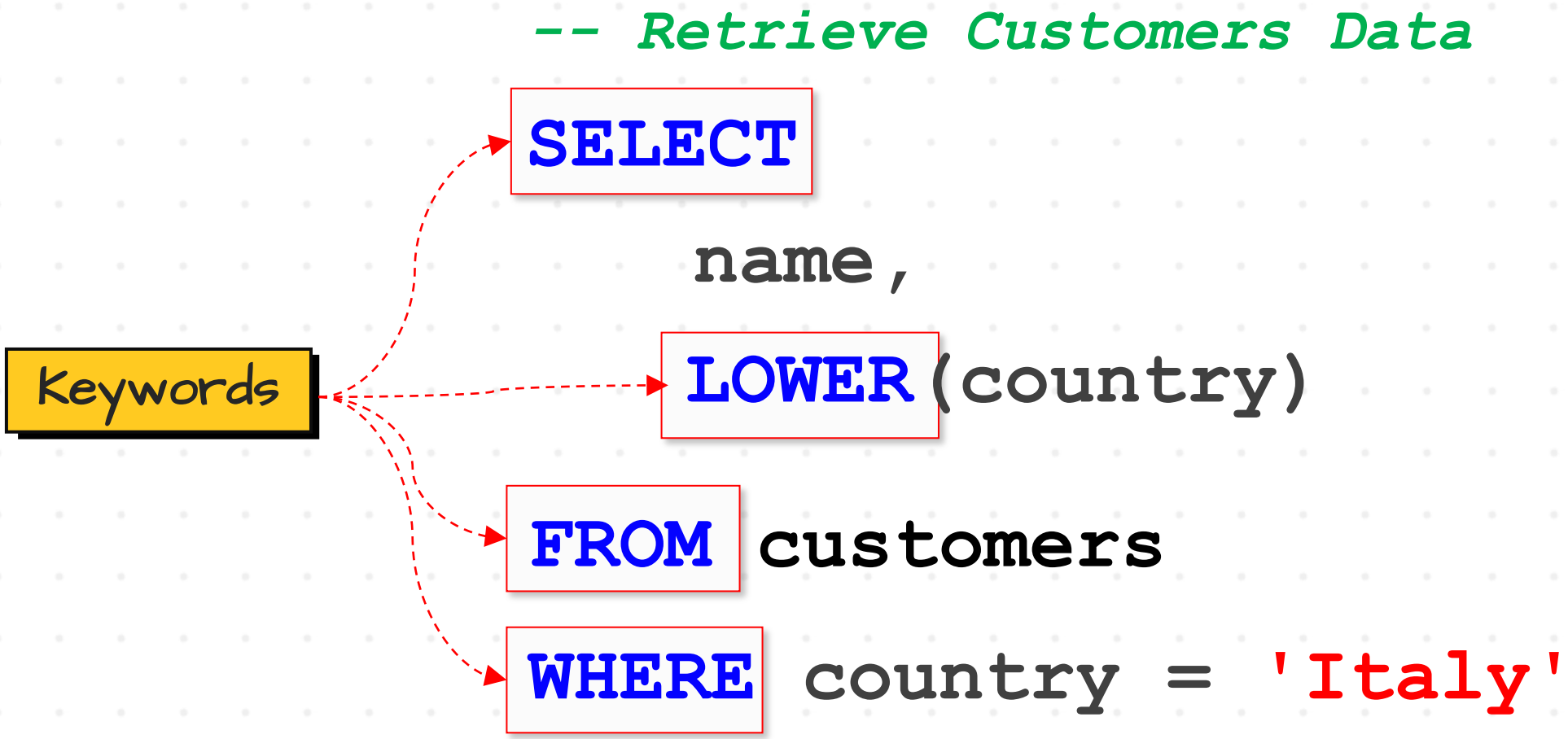
SQL STATEMENT

```sql
-- Retrieve Customers Data

SELECT

    name,

    LOWER(country)

FROM customers

WHERE country = 'Italy'
```

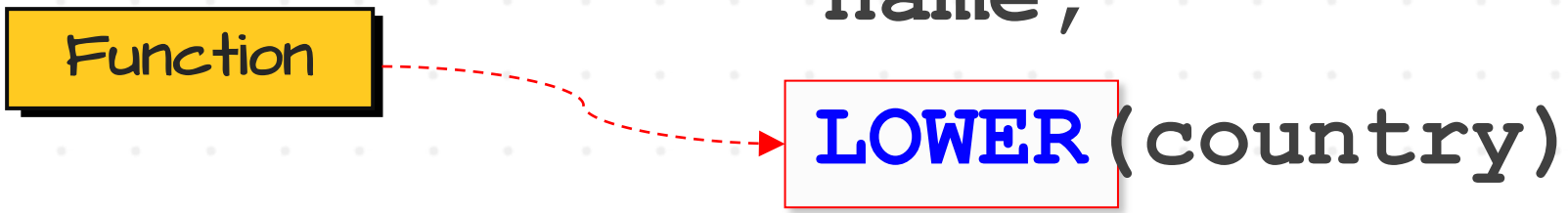
Comment

```sql
-- Retrieve Customers Data
SELECT
    name,
    LOWER(country)
FROM customers
WHERE country = 'Italy'
```


-- Retrieve Customers Data
SELECT
name,
LOWER(country)
Clauses
FROM customers
WHERE country = 'Italy'


-- Retrieve Customers Data
SELECT
name,
Keywords
LOWER(country)
FROM customers
WHERE country = 'Italy'

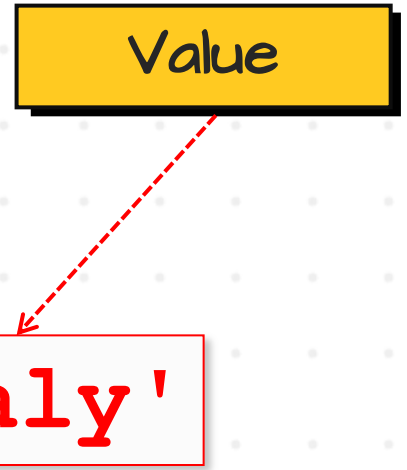
```sql
-- Retrieve Customers Data
SELECT
    name,
    LOWER(country)
FROM customers
WHERE country = 'Italy'
```



```sql
-- Retrieve Customers Data
SELECT
    name,
    LOWER(country)
FROM customers
WHERE country = 'Italy'
```

```sql
-- Retrieve Customers Data
SELECT
    name,
    LOWER(country)

FROM customers

WHERE country = 'Italy'
```

```sql
-- Retrieve Customers Data
SELECT
    name,
    LOWER(country)

FROM customers

WHERE country = 'Italy'
```



QUERY DATA

SELECT STATEMENT

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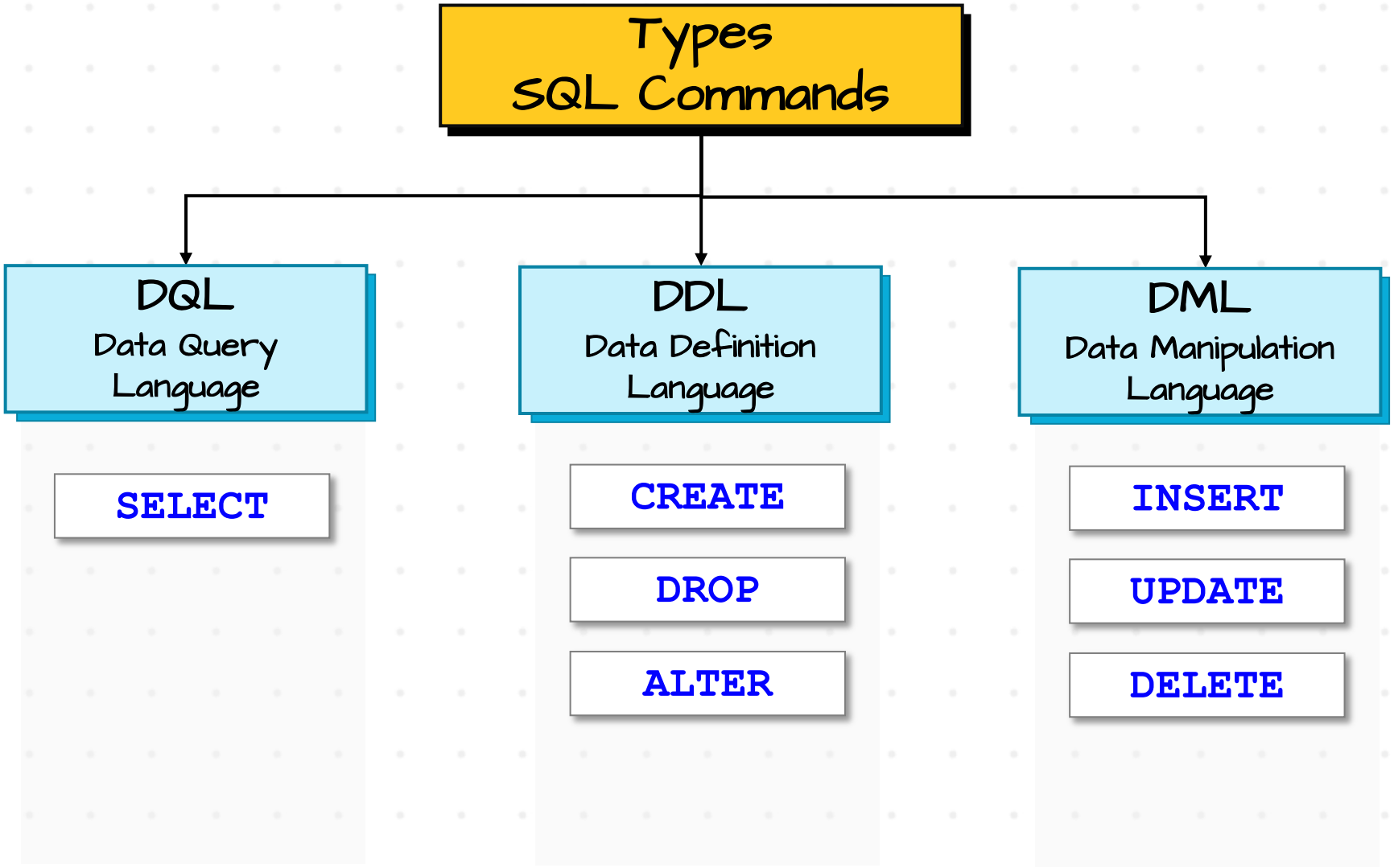
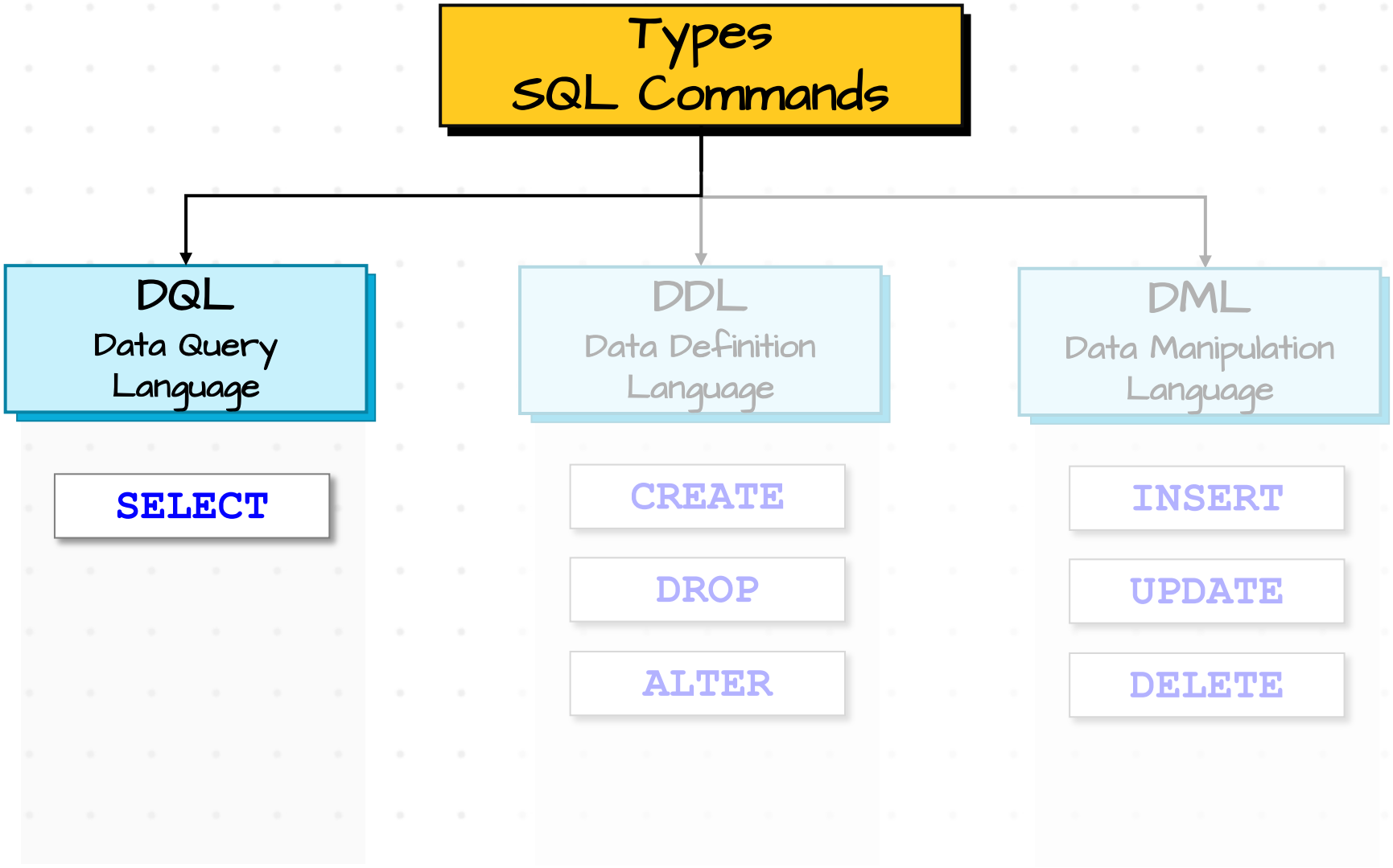

Types
SQL Commands
DQL
Data Query Language
SELECT
DDL
Data Definition Language
CREATE
DROP
ALTER
DML
Data Manipulation Language
INSERT
UPDATE
DELETE


Types
SQL Commands
DQL
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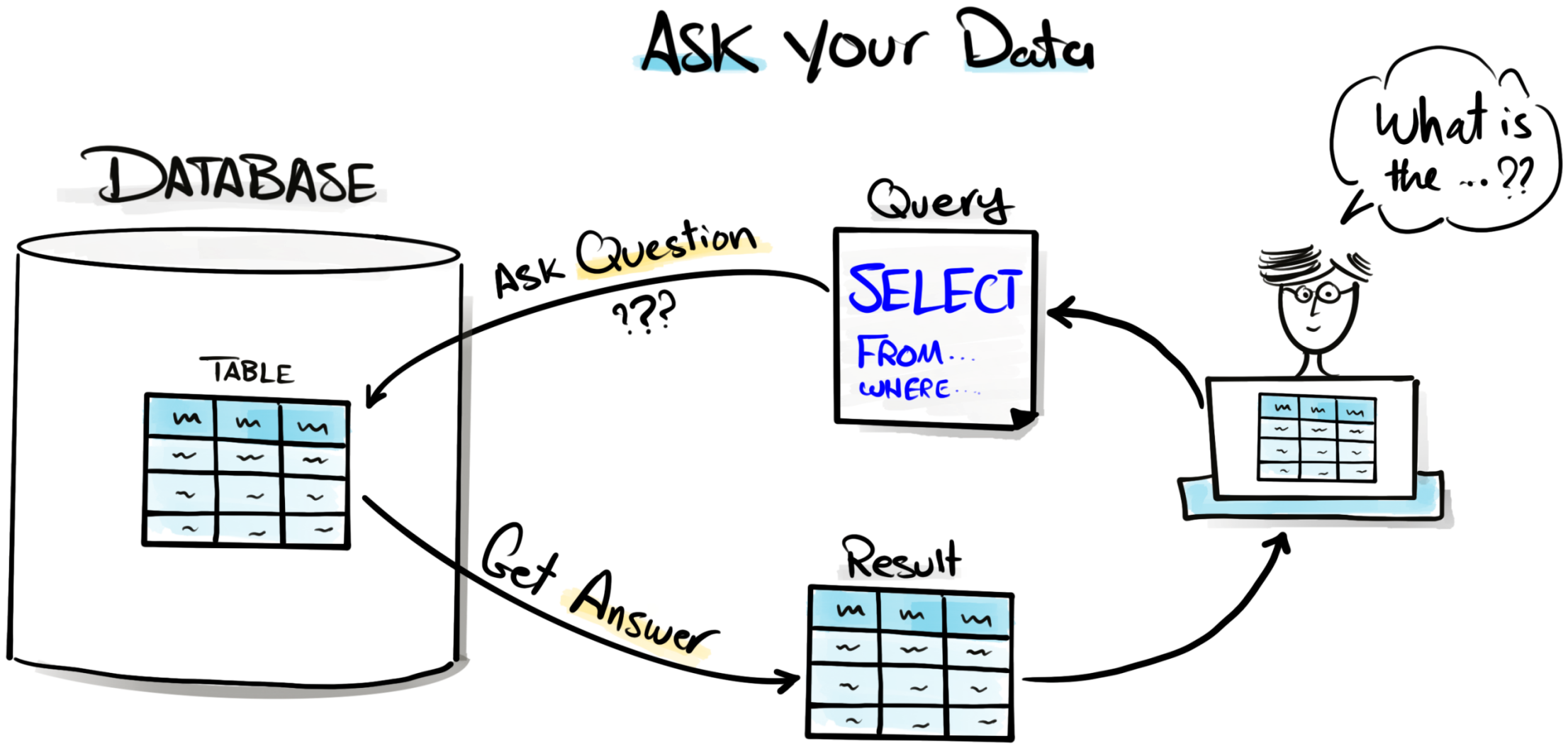
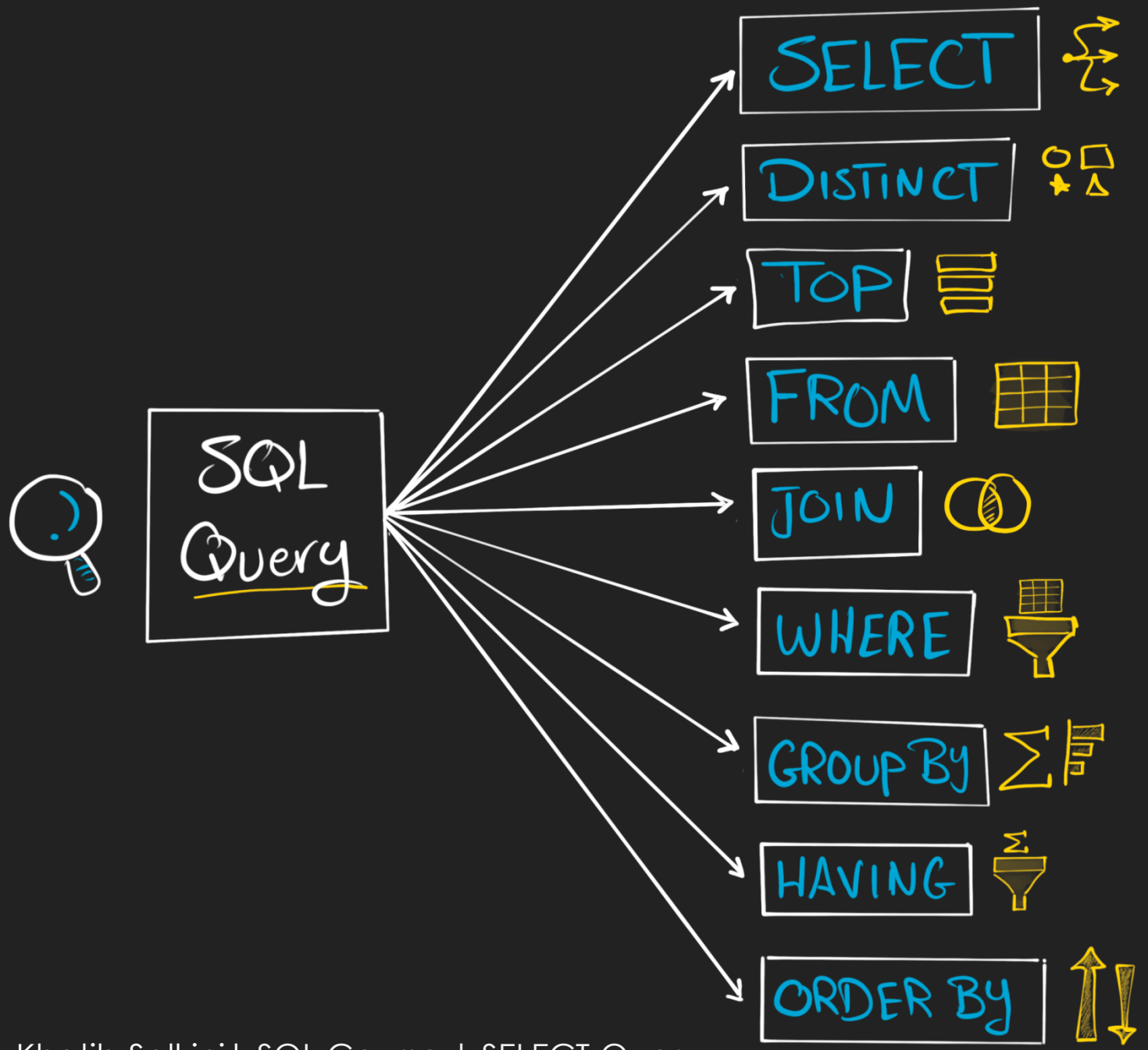
Data Manipulation
Language
INSERT
UPDATE
DELETE


Ask your Data
DATABASE
TABLE
Query
SELECT
FROM...
WHERE...
Ask Question
???
Get Answer
Result
What is the ...??


SQL Query
SELECT
DISTINCT
TOP
FROM
JOIN
WHERE
GROUP BY
HAVING
ORDER BY

Database

id	name	Country	Score
1	Maria	Germany	350
2	John	USA	900
3	Georg	UK	750
4	Martin	Germany	500
5	Peter	USA	0

SELECT *

FROM Table

Select * (All)

Retrieves All Columns (Everything)

From

Tells SQL Where to find Your Data

Database

id	name	Country	Score
1	Maria	Germany	350
2	John	USA	900
3	Georg	UK	750
4	Martin	Germany	500
5	Peter	USA	0

2 SELECT *

1 FROM Table

Keep All Columns!!

id	name	Country	Score
1	Maria	Germany	350
2	John	USA	900
3	Georg	UK	750
4	Martin	Germany	500
5	Peter	USA	0

Database

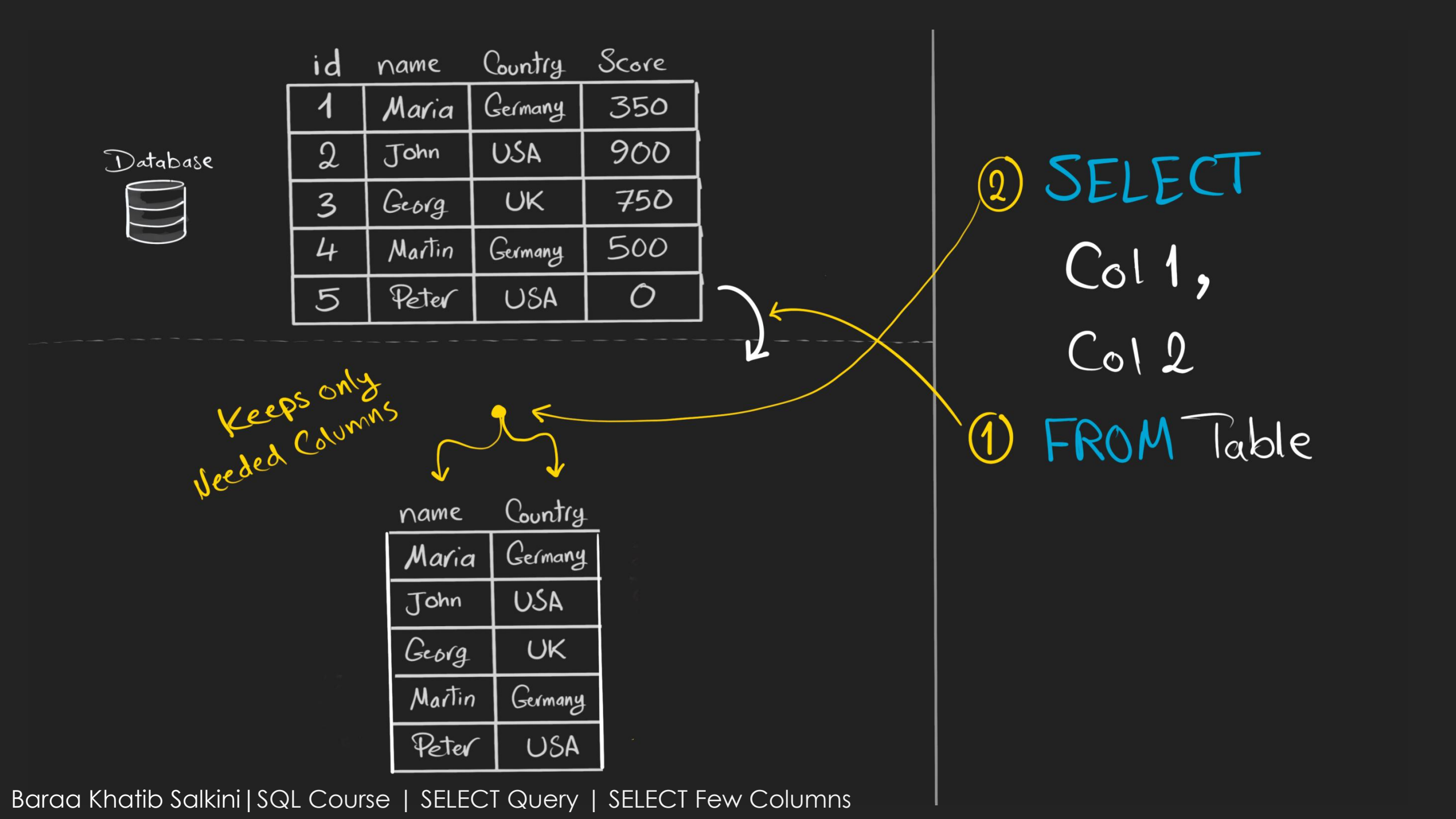
id	name	Country	Score
1	Maria	Germany	350
2	John	USA	900
3	Georg	UK	750
4	Martin	Germany	500
5	Peter	USA	0

```
SELECT
Col 1,
Col 2
FROM Table
```

Select Few Columns

Pick only the Columns You Need

instead of All.


Database
id name Country Score
1 Maria Germany 350
2 John USA 900
3 Georg UK 750
4 Martin Germany 500
5 Peter USA 0
② SELECT
Col 1,
Col 2
① FROM Table
Keeps only
Needed Columns
name Country
Maria Germany
John USA
Georg UK
Martin Germany
Peter USA

Database

id	name	Country	Score
1	Maria	Germany	350
2	John	USA	900
3	Georg	UK	750
4	Martin	Germany	500
5	Peter	USA	0

```
SELECT *
FROM Table
WHERE Condition
```

Where

Filters Your Data based on a Condition

Score Higher than 500

Database

id	name	Country	Score
1	Maria	Germany	350
2	John	USA	900
3	Georg	UK	750
4	Martin	Germany	500
5	Peter	USA	0

3 SELECT *

1 FROM Table

2 WHERE Condition

Score > 500

id	name	Country	Score	
1	Maria	Germany	350	✗
2	John	USA	900	✓
3	Georg	UK	750	✓
4	Martin	Germany	500	✗
5	Peter	USA	0	✗

Database

id	name	Country	Score
1	Maria	Germany	350
2	John	USA	900
3	Georg	UK	750
4	Martin	Germany	500
5	Peter	USA	0

```
SELECT *
FROM Table
ORDER BY Score DESC
```

Order By

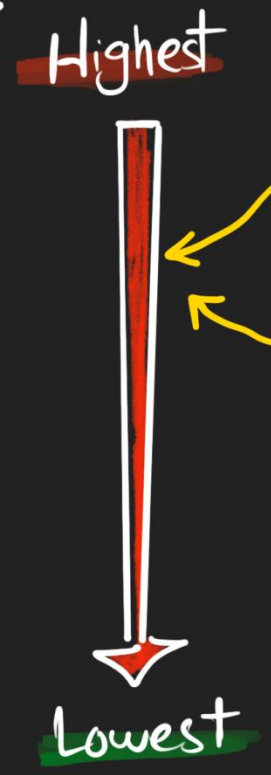
Sort Your Data

- ASC
  - Lowest
  - Highest
- DESC
  - Highest
  - Lowest

Database

id	name	Country	Score
1	Maria	Germany	350
2	John	USA	900
3	Georg	UK	750
4	Martin	Germany	500
5	Peter	USA	0

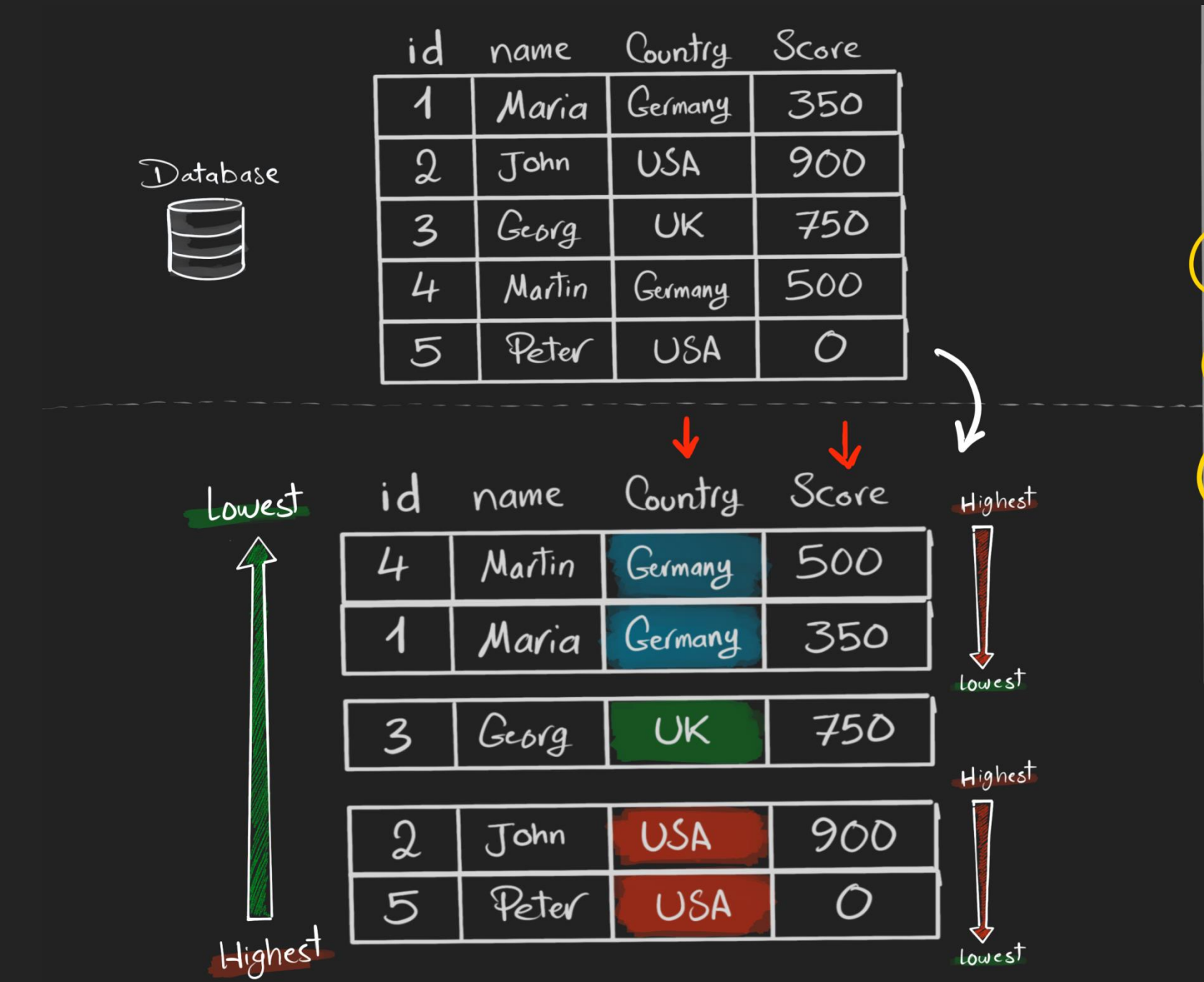
id	name	Country	Score
2	John	USA	900
3	Georg	UK	750
4	Martin	Germany	500
1	Maria	Germany	350
5	Peter	USA	0



③ SELECT *

① FROM Table

② ORDER BY Score DESC



3 SELECT *

1 FROM Table

2 ORDER BY

Country ASC,

Score DESC

Database

id	name	Country	Score
1	Maria	Germany	350
2	John	USA	900
3	Georg	UK	750
4	Martin	Germany	500
5	Peter	USA	0

Group By

Combines rows with the Same Value

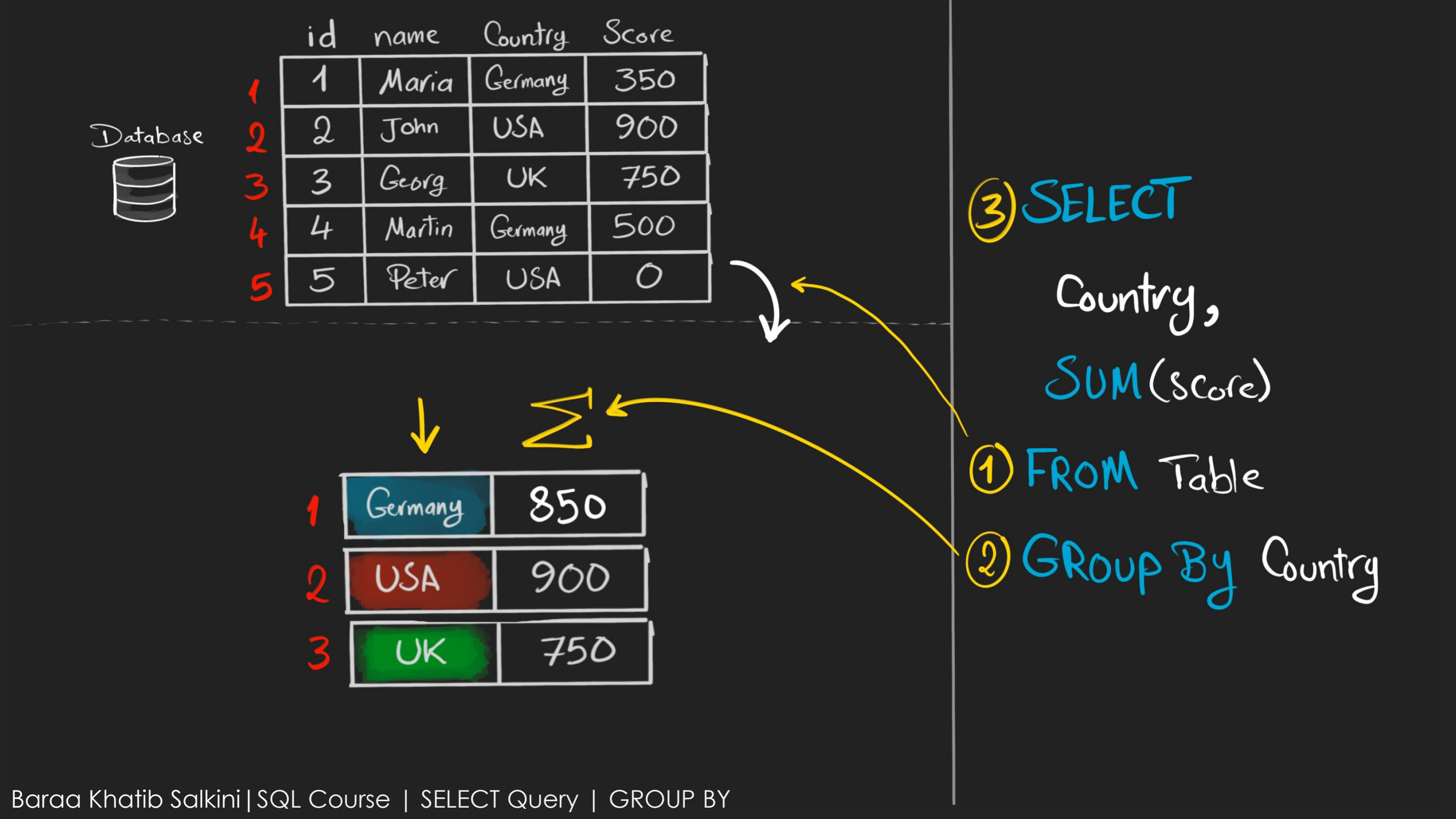
Aggregates a Column By another Column

Total Score By Country

```
SELECT
    Country,
    SUM(score)
FROM Table
GROUP By Country
```

Category

Aggregation


id
name
Country
Score
1
Maria
Germany
350
2
John
USA
900
3
Georg
UK
750
4
Martin
Germany
500
5
Peter
USA
0
Database
Σ
1
Germany
850
2
USA
900
3
UK
750
3 SELECT
Country,
SUM(score)
1 FROM Table
2 GROUP BY Country

Database

id	name	Country	Score
1	Maria	Germany	350
2	John	USA	900
3	Georg	UK	750
4	Martin	Germany	500
5	Peter	USA	0

Having

Filters Data After Aggregation

Can be used only with Group By

```
SELECT
  Country,
  SUM(score)
FROM Table
GROUP BY Country
HAVING SUM(score) > 800
```

Database

id	name	Country	Score
1	Maria	Germany	350
2	John	USA	900
3	Georg	UK	750
4	Martin	Germany	500
5	Peter	USA	0

Germany	850
USA	900

Total Score > 800

④ SELECT
Country,
SUM(score)

① FROM Table

② GROUP BY Country

③ HAVING SUM(score) > 800

Database

id	name	Country	Score
1	Maria	Germany	350
2	John	USA	900
3	Georg	UK	750
4	Martin	Germany	500
5	Peter	USA	0

Filter Your Data

① Before Aggregation

② After Aggregation

```
SELECT
  Country,
  SUM(score)
FROM Table
WHERE Score > 400
GROUP BY Country
HAVING SUM(score) > 800
```

Database

id	name	Country	Score
1	Maria	Germany	350
2	John	USA	900
3	Georg	UK	750
4	Martin	Germany	500
5	Peter	USA	0

SELECT DISTINCT

Col

FROM Table

Distinct

Removes Duplicates (Repeated Values)

each Value appears only Once

Database

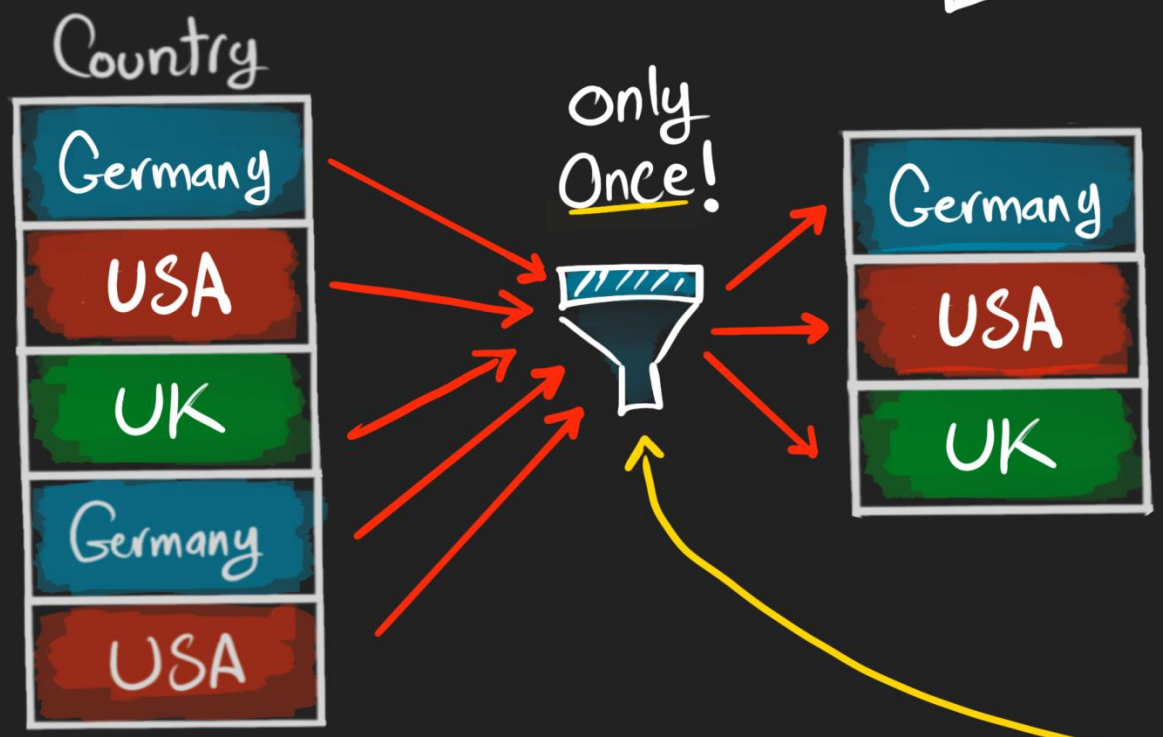
id	name	Country	Score
1	Maria	Germany	350
2	John	USA	900
3	Georg	UK	750
4	Martin	Germany	500
5	Peter	USA	0

1 FROM Table

Country

2 SELECT DISTINCT

3



Database

id	name	Country	Score
1	Maria	Germany	350
2	John	USA	900
3	Georg	UK	750
4	Martin	Germany	500
5	Peter	USA	0

Top (Limit)

Restrict the Number of Rows Returned

```
SELECT Top 3
*
FROM Table
```

Database

id	name	Country	Score
1	Maria	Germany	350
2	John	USA	900
3	Georg	UK	750
4	Martin	Germany	500
5	Peter	USA	0

③ ② SELECT Top 3

\+

① FROM Table

	id	name	Country	Score
Row 1 →	1	Maria	Germany	350
Row 2 →	2	John	USA	900
Row 3 →	3	Georg	UK	750

Execute Order

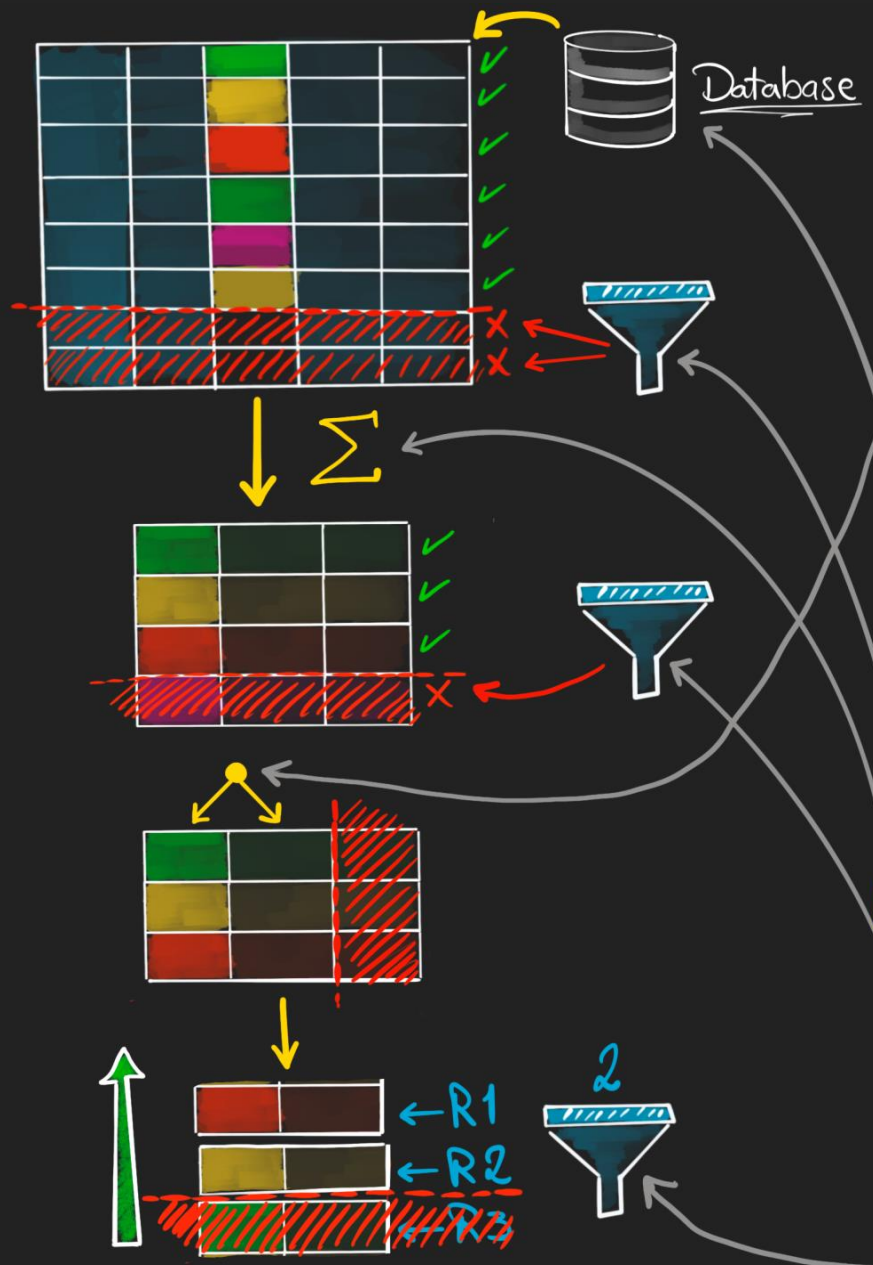
- Filter Columns
- Filter Duplicates
- Filter Result Rows
- Filter Rows Before Aggregations
- Filter Rows After Aggregations

Coding Order

```
SELECT DISTINCT TOP 2
    Col1,
    SUM(Col2)
FROM Table
WHERE Col = 10
GROUP BY Col1
HAVING SUM(Col2) >30
ORDER BY Col1 ASC
```

Execute Order

1. FROM
2. WHERE
3. GROUP BY
4. HAVING
5. SELECT DISTINCT
6. ORDER BY
7. TOP



Coding Order

5. SELECT DISTINCT Col1, SUM(Col2) — TOP 2 — 7
1. FROM Table
2. WHERE Col = 10
3. GROUP BY Col1
4. HAVING SUM(Col2) >30
6. ORDER BY Col1 ASC

BONUS

Sketches

Baraa Khatib Salkini

SQL Course | SELECT Query

Database

Customers

id	name	Country	Score
1	Maria	Germany	350
2	John	USA	900
3	Georg	UK	750
4	Martin	Germany	500
5	Peter	USA	0

① FROM

Result

② SELECT ★

id	name	Country	Score
1	Maria	Germany	350
2	John	USA	900
3	Georg	UK	750
4	Martin	Germany	500
5	Peter	USA	0

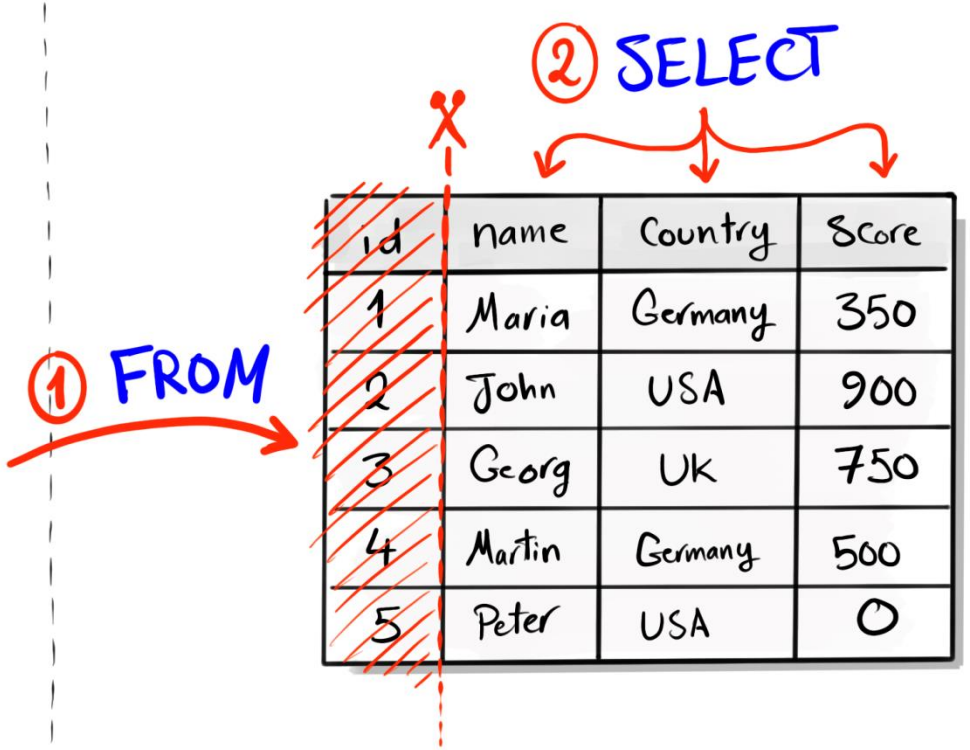
Execute Order

① FROM

Database

Customers

id	name	Country	Score
1	Maria	Germany	350
2	John	USA	900
3	Georg	Uk	750
4	Martin	Germany	500
5	Peter	USA	0



Result

id	name	Country	Score
1	Maria	Germany	350
2	John	USA	900
3	Georg	Uk	750
4	Martin	Germany	500
5	Peter	USA	0

Execute Order

1 FROM

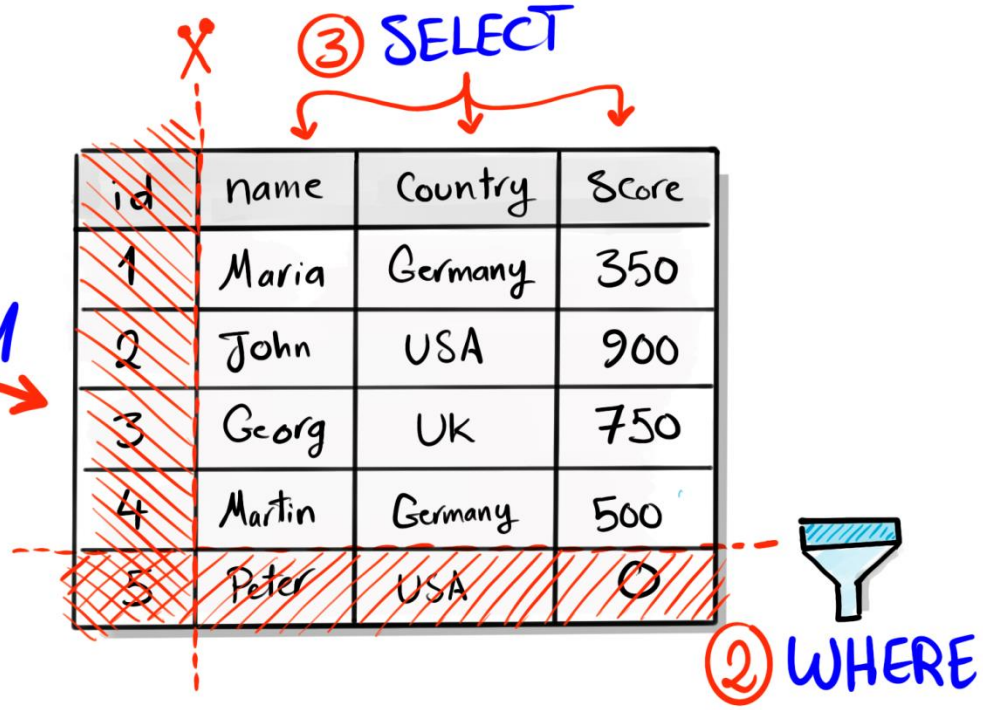
2 SELECT

Database

Customers

id	name	Country	Score
1	Maria	Germany	350
2	John	USA	900
3	Georg	Uk	750
4	Martin	Germany	500
5	Peter	USA	0

Result



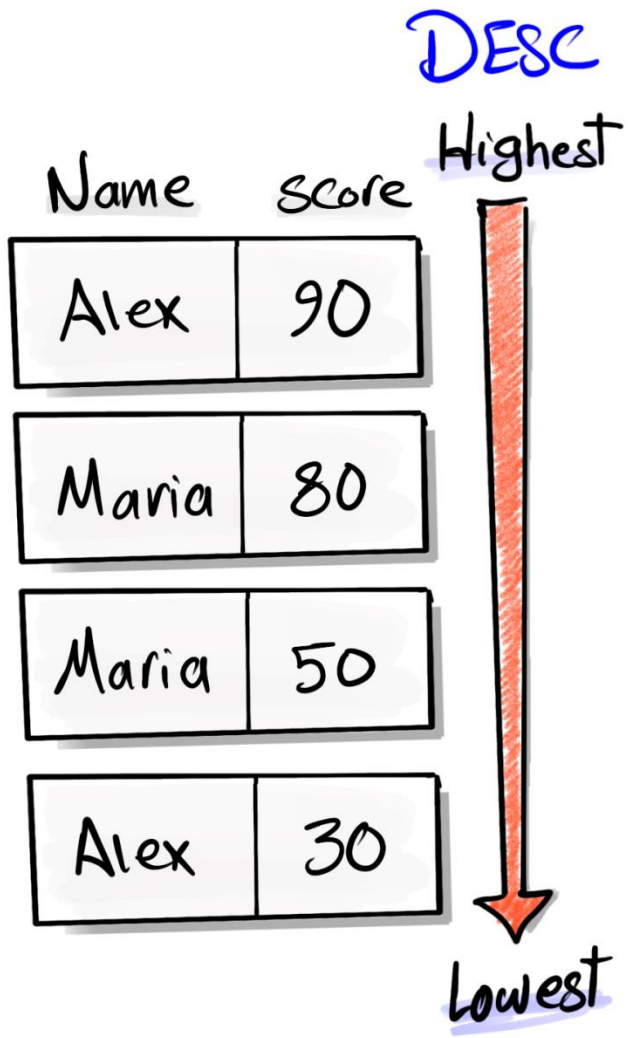
Execute Order

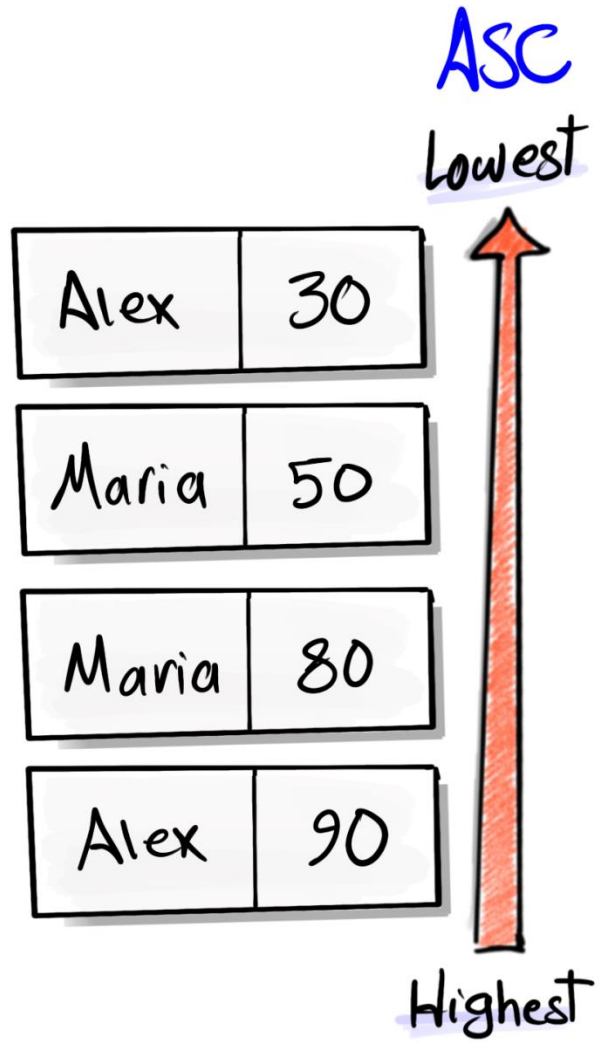
1 FROM

2 WHERE

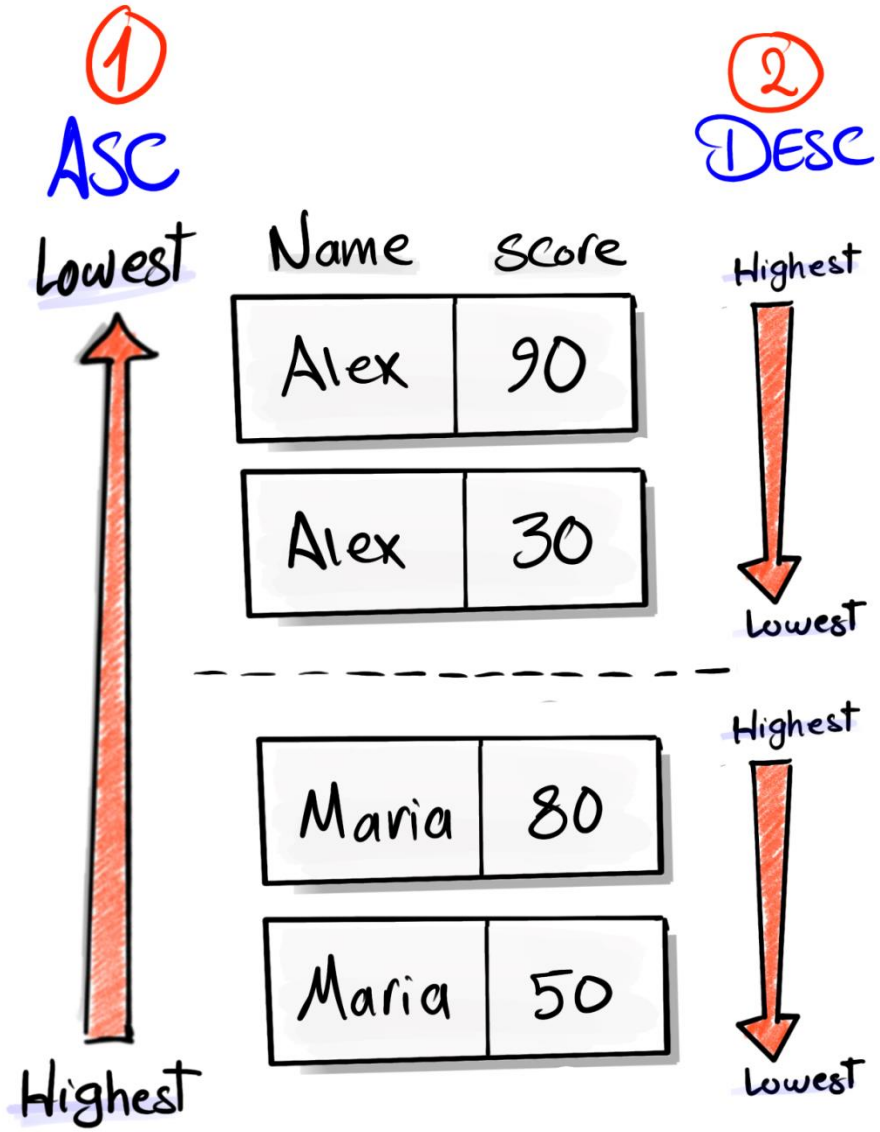
3 SELECT


Name
score
Alex
90
Maria
50
Alex
30
Maria
80


DESC
Highest
Name
score
Alex
90
Maria
80
Maria
50
Alex
30
Lowest


ASC
Lowest
Alex
30
Maria
50
Maria
80
Alex
90
Highest

Name	score
Alex	90
Maria	50
Alex	30
Maria	80



Database

Customers

id	name	Country	Score
1	Maria	Germany	350
2	John	USA	900
3	Georg	Uk	750
4	Martin	Germany	500
5	Peter	USA	0

① FROM

Result

id	name	Country	Score
1	Maria	Germany	350
2	John	USA	900
3	Georg	Uk	750
4	Martin	Germany	500
5	Peter	USA	0

② WHERE

Σ ③ GROUP BY

Country	Avg
Germany	425
USA	900
Uk	500

④ SELECT

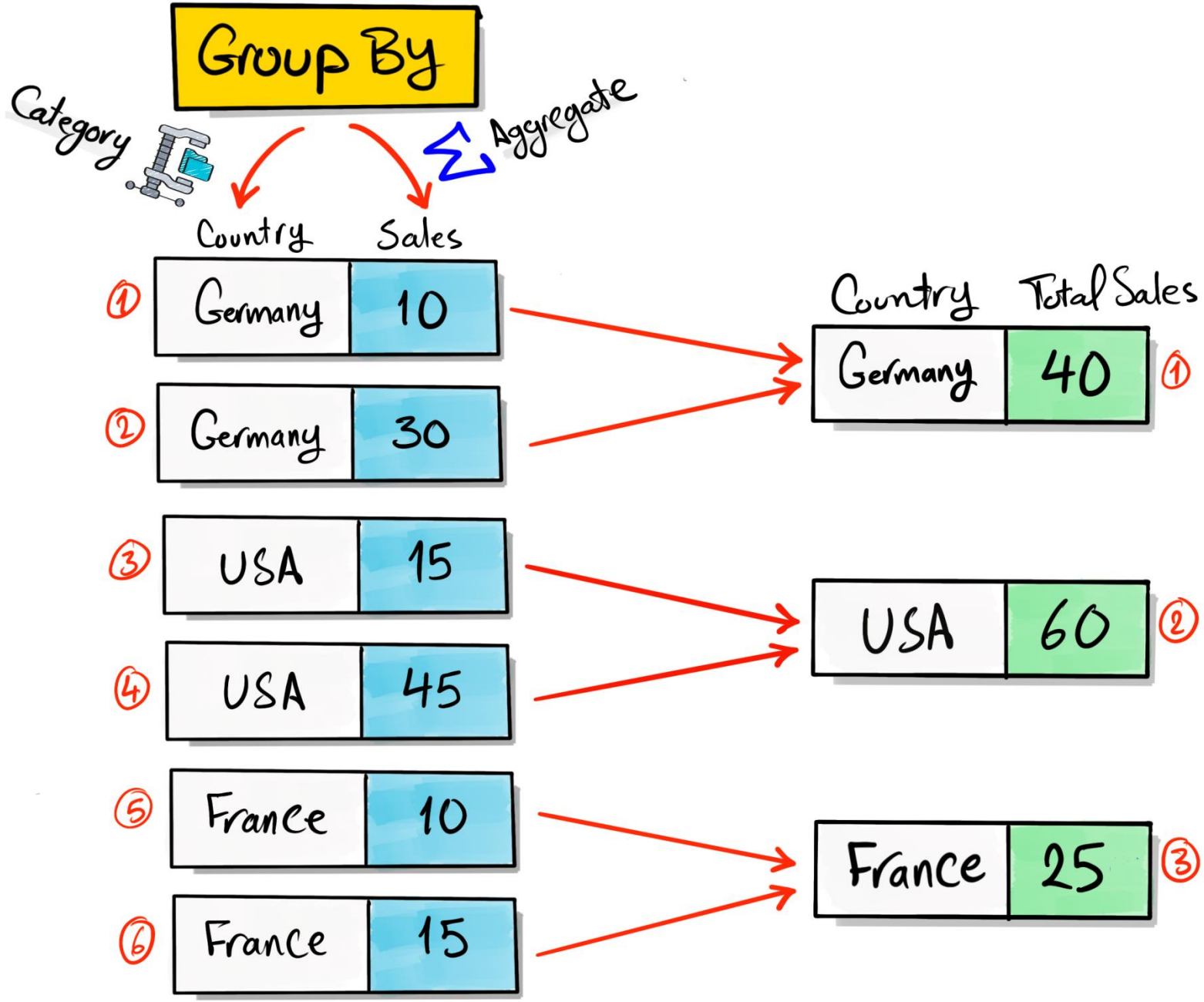
Execute Order

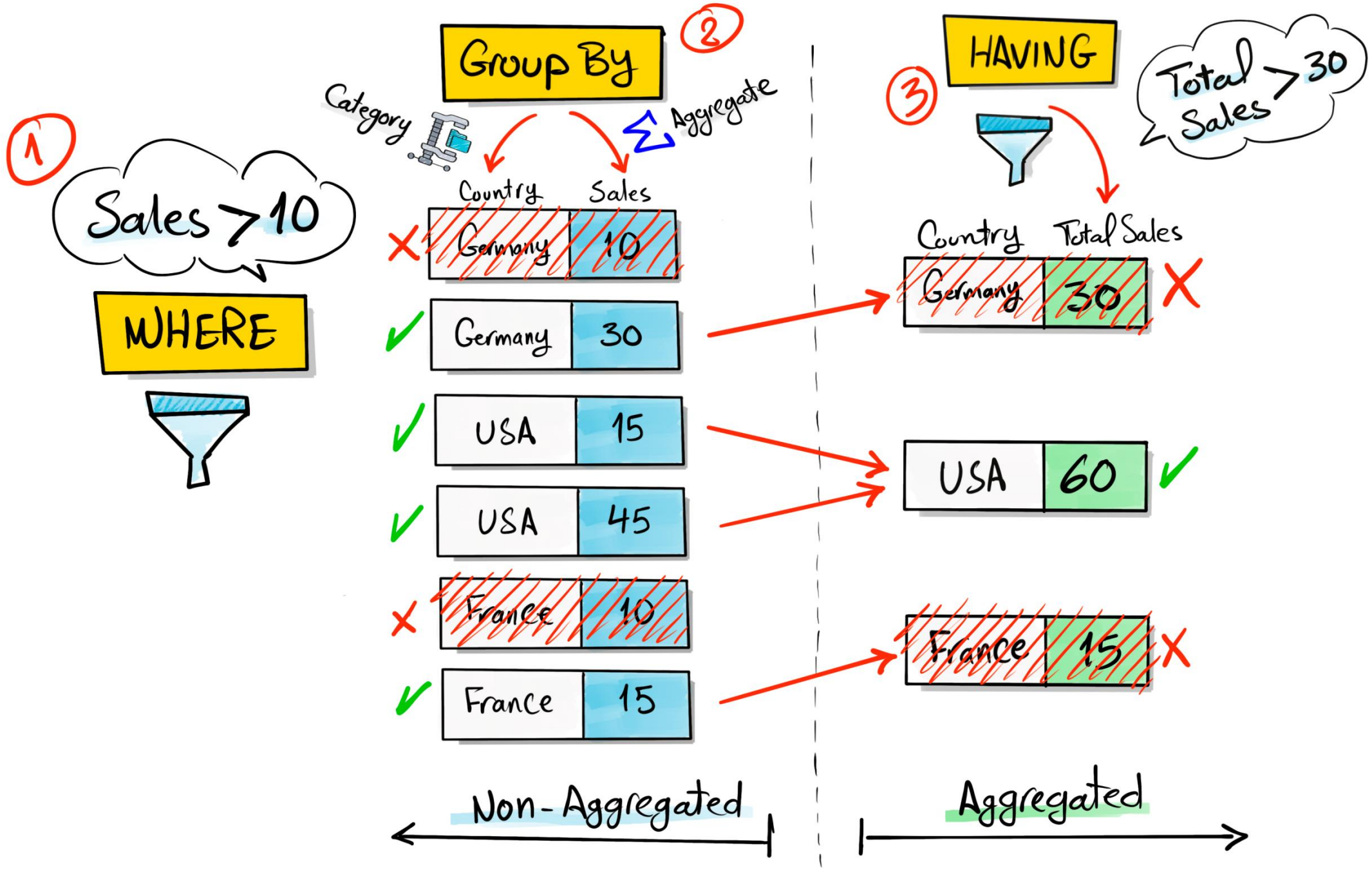
① FROM

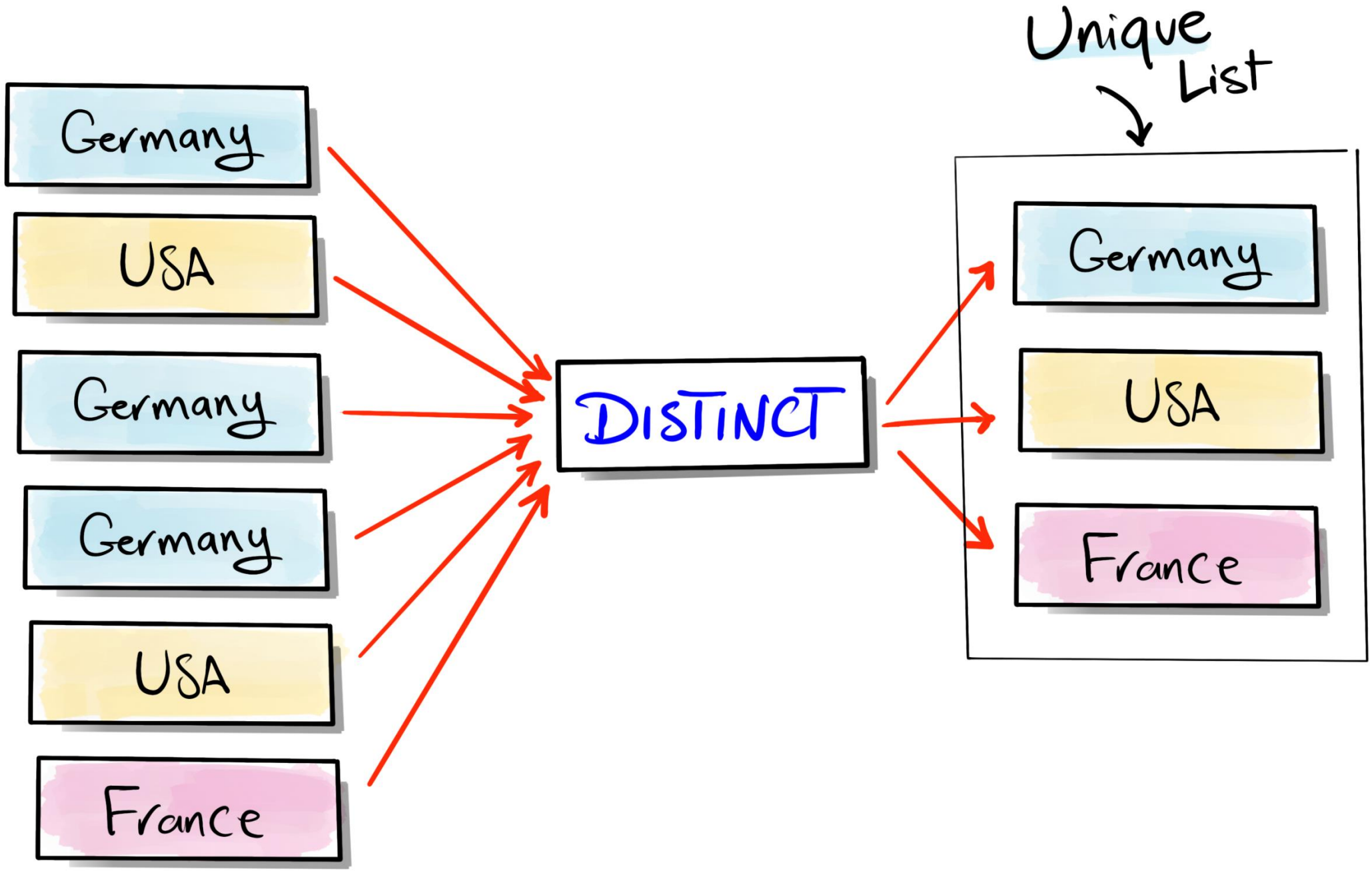
② WHERE

③ GROUP BY

④ SELECT


Group By
Category
Aggregate
Country
Sales
1
Germany
10
2
Germany
30
3
USA
15
4
USA
45
5
France
10
6
France
15
Country
Total Sales
Germany
40
1
USA
60
2
France
25
3

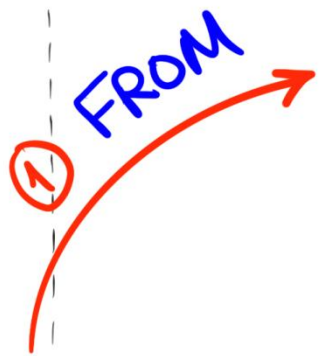

1
Sales > 10
WHERE
2
Group By
Category
Aggregate
Country
Sales
Germany
10
Germany
30
USA
15
USA
45
France
10
France
15
Non-Aggregated
3
HAVING
Total Sales > 30
Country
Total Sales
Germany
30
USA
60
France
15
Aggregated


Unique List
Germany
USA
Germany
Germany
USA
France
DISTINCT
Germany
USA
France

Database

Customers

id	name	Country	Score
1	Maria	Germany	350
2	John	USA	900
3	Georg	Uk	750
4	Martin	Germany	500
5	Peter	USA	0



Result

id	name	Country	Score
1	Maria	Germany	350
2	John	USA	900
3	Georg	Uk	750
4	Martin	Germany	500
5	Peter	USA	0

2 WHERE

Σ 3 GROUP BY

Country	Avg
Germany	425
USA	900
Uk	500

4 HAVING

Country	Avg
Uk	500
USA	900

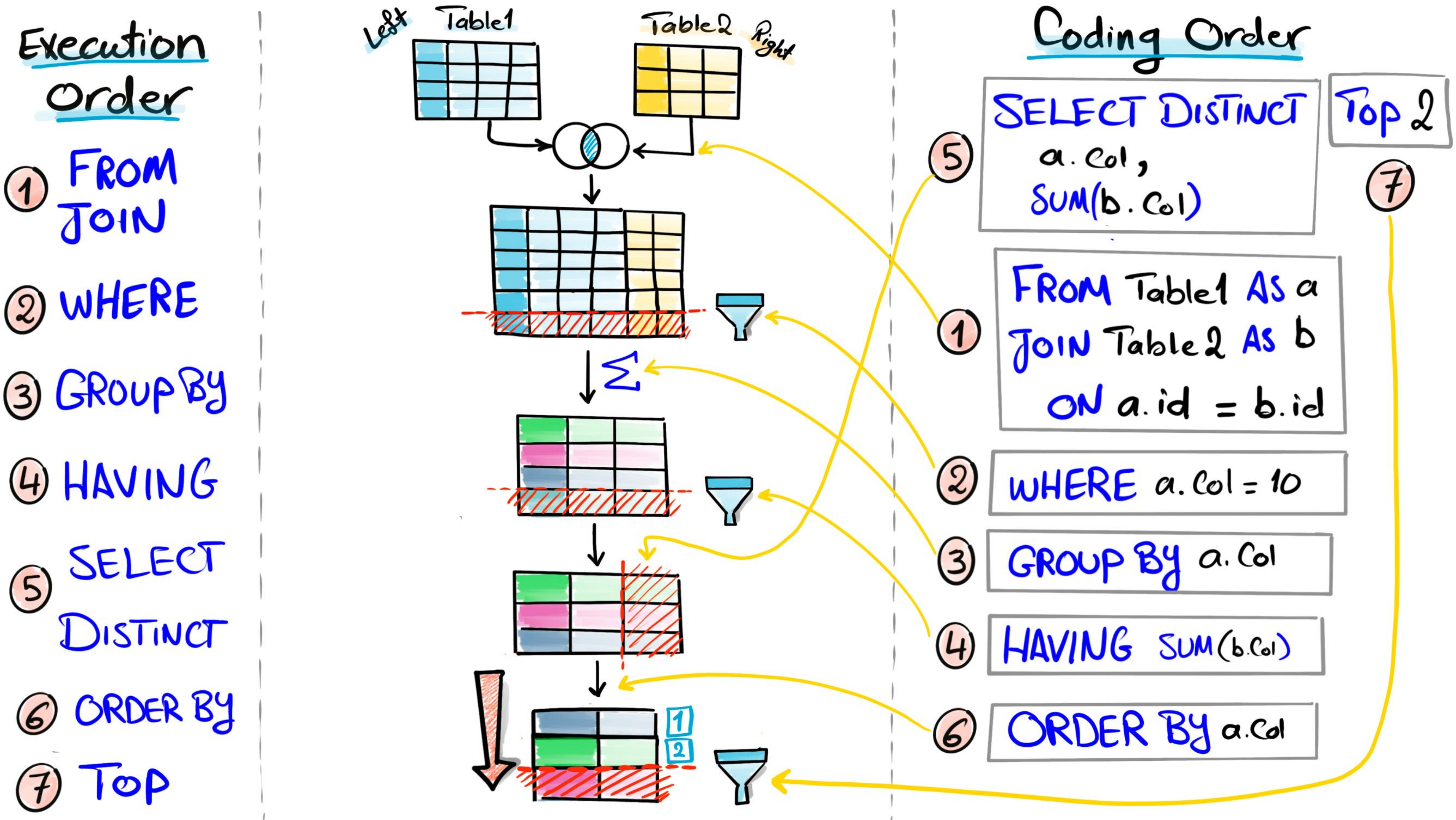
5 ORDER BY

ASC

6 SELECT

Execute Order

1. FROM
2. WHERE
3. GROUP BY
4. HAVING
5. ORDER BY
6. SELECT


Execution Order
1 FROM JOIN
2 WHERE
3 GROUP BY
4 HAVING
5 SELECT DISTINCT
6 ORDER BY
7 TOP
Left
Table1
Table2
Right
Σ
1
2
Coding Order
5 SELECT DISTINCT
a.Col,
SUM(b.Col)
Top 2
7
1 FROM Table1 AS a
JOIN Table2 AS b
ON a.id = b.id
2 WHERE a.Col = 10
3 GROUP BY a.Col
4 HAVING SUM(b.Col)
6 ORDER BY a.Col