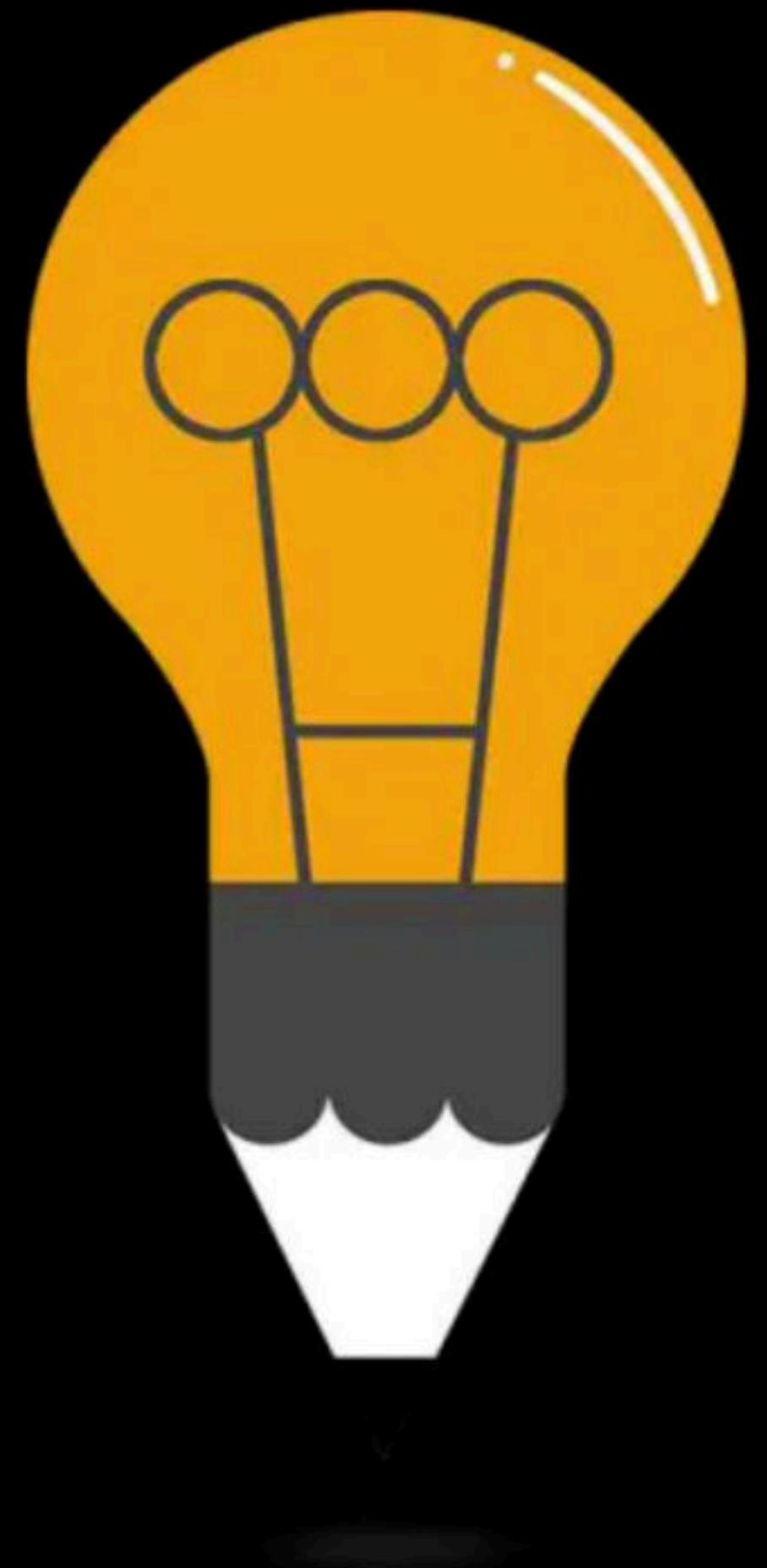






# SQL: Part II

Complete Course on Database Management System



# DBMS Relational Modeling

By: Vishvadeep Gothi

Branch

foreign key

Account

<u>B_id</u>	Bname
B1	M.G. road
B2	New road
B3	Muthes road
<del>B4</del> B5	Nagere

<u>AC_id</u>	<u>B_id</u>	Amount
1	<del>B1</del> NULL	5000
2	<del>B1</del> NULL	6000
3	B2	8000
4	B3	9000
5	<del>B4</del> B5	2000
6	<del>B4</del> B5	5000

① on update cascade

② on delete

- Cascade
- Set NULL
- No action  $\Rightarrow$

# SQL: Structured Query Language

Domain-specific language used in programming and designed for managing data held in a RDBMS

# SQL: Structured Query Language

Domain-specific language used in programming and designed for managing data held in a RDBMS

Operations performed using SQL:

Inserting data

Retrieving data ✓

Updating data

Deleting data

And many more ....

# Customers Table

<u>CustomerID</u>	CustomerName	ContactName	Address	City	PostalCode	Country
1	Alfreds Futterkiste	Maria Anders	Obere Str. 57	Berlin	12209	Germany
2	Ana Trujillo Emparedados y helados	Ana Trujillo	Avda. de la Constitución 2222	México D.F.	05021	Mexico
3	Antonio Moreno Taquería	Antonio Moreno	Mataderos 2312	México D.F.	05023	Mexico
4	Around the Horn	Thomas Hardy	120 Hanover Sq.	London	WA1 1DP	UK
5	Berglunds snabbköp	Christina Berglund	Berguvsvägen 8	Luleå	S-958 22	Sweden
6	Blauer See Delikatessen	Hanna Moos	Forsterstr. 57	Mannheim	68306	Germany
7	Blondel père et fils	Frédérique Citeaux	24, place Kléber	Strasbourg	67000	France
8	Bólido Comidas preparadas	Martín Sommer	C/ Araquil, 67	Madrid	28023	Spain

# SQL Datatypes

## String

Data Type	Description
CHAR(size)	A FIXED length string (can contain letters, numbers, and special characters). The size parameter specifies the column length in characters - can be from 0 to 255. Default is 1
VARCHAR(size)	A VARIABLE length string (can contain letters, numbers, and special characters). The size parameter specifies the maximum column length in characters - can be from 0 to 65535

# SQL Datatypes

## Numeric

Data Type	Description
Bit(size)	A bit-value type. The number of bits per value is specified in size. The size parameter can hold a value from 1 to 64. The default value for size is 1
BOOL	Zero is considered as false, nonzero values are considered as true.
BOOLEAN	Equal to BOOL
INT(Size)	A medium integer. Signed range is from -2147483648 to 2147483647. Unsigned range is from 0 to 4294967295. The size parameter specifies the maximum display width (which is 255)
INTEGER(Size)	Equal to INT(size)

# SQL Datatypes

## Numeric

Data Type	Description
BIGINT(size)	A large integer. Signed range is from -9223372036854775808 to 9223372036854775807. Unsigned range is from 0 to 18446744073709551615. The size parameter specifies the maximum display width (which is 255)
FLOAT(size, d)	A floating point number. The total number of digits is specified in size. The number of digits after the decimal point is specified in the d parameter. This syntax is deprecated in MySQL 8.0.17
FLOAT(p)	A floating point number. MySQL uses the p value to determine whether to use FLOAT or DOUBLE for the resulting data type. If p is from 0 to 24, the data type becomes FLOAT(). If p is from 25 to 53, the data type becomes DOUBLE()

# SQL Datatypes

## Numeric

Data Type	Description
DOUBLE(size, d)	A normal-size floating point number. The total number of digits is specified in size. The number of digits after the decimal point is specified in the d parameter
DECIMAL(size, d)	An exact fixed-point number. The total number of digits is specified in size. The number of digits after the decimal point is specified in the d parameter. The maximum number for size is 65. The maximum number for d is 30. The default value for size is 10. The default value for d is 0.
DEC(size, d)	Equal to DECIMAL(size,d)

# Case Sensitivity

SQL is not case sensitive

only DB values are case sensitive

# Semicolon Mandatory?

NO

Query 1

run

Query 1 ;

Query 2 ;

Query 3 ;

run all queries together  
then after each query  
Semicolon needed.

Tiny MySQL ↪

## SQL Statement:

```
SELECT * FROM Customers  
ORDER BY CustomerName ASC;
```

[Get your own SQL server](#)

Edit the SQL Statement, and click "Run SQL" to see the result.

[Run SQL »](#)

## Result:

Click "**Run SQL**" to execute the SQL statement above.

W3Schools has created an SQL database in your browser.

Your Database:

Tablename	Records
<a href="#">Customers</a>	91
<a href="#">Categories</a>	8
<a href="#">Employees</a>	10
<a href="#">OrderDetails</a>	518
<a href="#">Orders</a>	196
<a href="#">Products</a>	77
<a href="#">Shippers</a>	3
<a href="#">Suppliers</a>	29
<a href="#">itemmaster</a>	7
<a href="#">product</a>	4

Indexes:

Name of Index
<a href="#">sqlite_autoindex_product</a>

[Restore Database](#)

# Select Command

Used to retrieve data from one or more tables

Syntax:

```
select * from tablename
```



# Select Command: All Columns

Select \* from customers

# Select Command: Selected Column

select column1 from tablename

select city from Customers  $\Rightarrow$  all rows of column city

city

## Select Command: Selected Multiple Columns

Select column1, Column2, .... from customers

Ex:- Select city, country from customers

Select country, city from customers

Country	city
-	.
-	.

# Select Command with distinct

Need to be used with select, to fetch only unique values of designated column(s)

select distinct column name from tablename

select distinct country from customers

# Select Command with distinct

select distinct Country from Customers

# Customers Table

CustomerID	CustomerName	ContactName	Address	City	PostalCode	Country
1	Alfreds Futterkiste	Maria Anders	Obere Str. 57	Berlin	12209	Germany
2	Ana Trujillo Emparedados y helados	Ana Trujillo	Avda. de la Constitución 2222	México D.F.	05021	Mexico
3	Antonio Moreno Taquería	Antonio Moreno	Mataderos 2312	México D.F.	05023	Mexico
4	Around the Horn	Thomas Hardy	120 Hanover Sq.	London	WA1 1DP	UK
5	Berglunds snabbköp	Christina Berglund	Berguvsvägen 8	Luleå	S-958 22	Sweden
6	Blauer See Delikatessen	Hanna Moos	Forsterstr. 57	Mannheim	68306	Germany
7	Blondel père et fils	Frédérique Citeaux	24, place Kléber	Strasbourg	67000	France
8	Bólido Comidas preparadas	Martín Sommer	C/ Araquil, 67	Madrid	28023	Spain

# Select Command with distinct

select distinct Country, PostalCode from Customers



Combination unique

Ex:-

cid	Country	PostalCode
1	India	123456
2	India	123456
3	India	456010
4	USA	85010

{ 3 rows

India	123456
India	456010
USA	85010

Select customerid, distinct country from customers



Error  
(not allowed)

# Select Command with distinct

select distinct itemp from itemmaster

itemmaster

item	itemp
1	2
2	4
3	null
4	null

itemp
2
4
NULL

3 rows

# Select Command with distinct

~~select distinct Country, PostalCode from Customers~~

# Select Command with where

# Select Command with where

Used with select, update, delete, insert commands

Used to filter specific rows from table

select columns from tablename where condition

# Select Command with where

Return all such customers' information who live in country Germany

```
Select * from customers where country = 'Germany'
```

# Select Command with where

Return all such customers' information have their CustomerId 3

```
Select * from customers where customerId = 3
```

# Select Command with where

Return name of the customer who has CustomerId 3

```
select customername from customers where customerid = 3
```

# Select Command with where

Return city and country of customers who have their CustomerId 3

select city, country from customers where customerId = 3

# Select Command with where

Can we use only = with where command?

# Select Command with where

Relational Operators used in where clause:

1. Equal  $=$
2. Not Equal  $\neq$
3. Less than  $<$
4. Less than or equal to  $\leq$
5. Greater than  $>$
6. Greater than or equal to  $\geq$

# OrderDetails Table

OrderDetailID	OrderID	ProductID	Quantity
1	10248	11	12
2	10248	42	10
3	10248	72	5
4	10249	14	9
5	10249	51	40
6	10250	41	10
7	10250	51	35
8	10250	65	15
9	10251	22	6
10	10251	57	15
11	10251	65	20
12	10252	20	40
13	10252	33	25
14	10252	60	40
15	10253	31	20
16	10253	39	42

# Select Command with where

Return all such orders details when quantity is atleast 10

```
select * from orderdetails where quantity >= 10
```

# Select Command with where

Return all such orders details when quantity is greater than 15

Select \* from orderdetails where Quantity > 15

# Select Command with where

Return all such orders details when quantity is maximum 10

select \* from orderdetails where quantity <= 10

# Select Command with where

Return all such orders details when quantity is less than 15

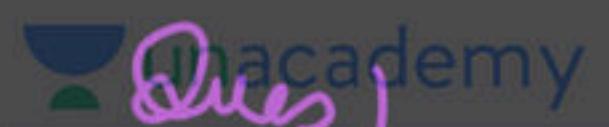
Select \* from orderDetails where Quantity < 15

# Select Command with where

Return all such orders details when quantity is not 10

select \* from orderdetails where quantity <> 10

$\downarrow = 10$



## Suppliers

Return city and postal code of those suppliers who are not based in USA ?

Select city, postal code from suppliers where country <> 'USA'

# Select Command with where

Logical Operators:

1. AND
2. OR
3. NOT

cond<sub>1</sub> AND cond<sub>2</sub>  $\Rightarrow$  True when cond<sub>1</sub>, cond<sub>2</sub> both  
are true

cond<sub>1</sub> OR cond<sub>2</sub>  $\Rightarrow$  — || — either of  
conditions is true.

# OrderDetails Table

OrderDetailID	OrderID	ProductID	Quantity
1	10248	11	12
2	10248	42	10
3	10248	72	5
4	10249	14	9
5	10249	51	40
6	10250	41	10
7	10250	51	35
8	10250	65	15
9	10251	22	6
10	10251	57	15
11	10251	65	20
12	10252	20	40
13	10252	33	25
14	10252	60	40
15	10253	31	20
16	10253	39	42

# Select Command with where

Select all such orders where quantity is atleast 5 and atmost 30

```
select * from orderdetails where quantity >= 5 and  
quantity <= 30
```

# Between Operator

Used to filter the records in the specific range

Between LB and UB

LB, UB inclusive

select \* from orderdetails where quantity between 5 and 30

# Between Operator

Return all such orders details when quantity is lesser than 10 or greater than 20

```
select * from orderdetails where quantity < 10 or  
quantity > 20
```



not in between 10 and 20

select \* from orderdetails where Quantity not between  
10 and 20

# NULL In RDBMS

# NULL In RDBMS

```
SELECT *  
FROM itemmaster  
WHERE itemp=NULL
```

item	itemp
1	2
2	4
3	null
4	null

Nothing because here in = operator NULL is taken as a value.

# NULL In RDBMS

```
SELECT *  
FROM itemmaster  
WHERE itemp is NULL
```

item	itemp
1	2
2	4
3	null
4	null

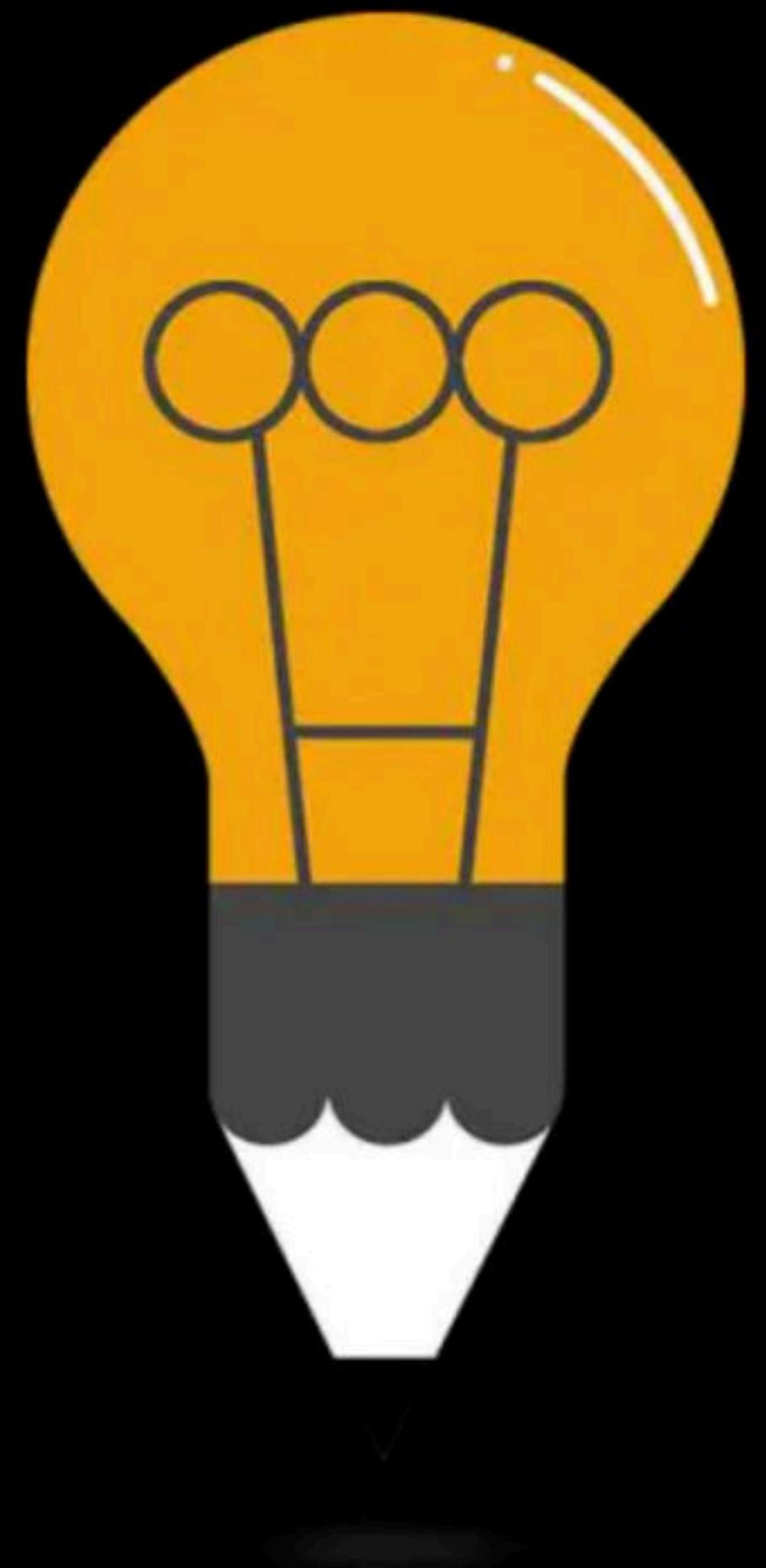
3 NVLL  
4 NVLL

# NULL In RDBMS

```
SELECT *  
FROM itemmaster  
WHERE itemp is NOT NULL
```

item	itemp
1	2
2	4
3	null
4	null

1 2  
3 4



# DPP: SQL

By: Vishvadeep Gothi

# Customers Table

CustomerID	CustomerName	ContactName	Address	City	PostalCode	Country
1	Alfreds Futterkiste	Maria Anders	Obere Str. 57	Berlin	12209	Germany
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# Question

Write query for all below questions on table Customers

1. Select all customers which are from country "Germany", "Berlin"
2. Fetch that customers' name, address city, postal code and country who has contact name 'Yang Wang'
3. Fetch all customers information till customerID 19
4. Fetch all customers information except from Country 'Germany', 'UK', 'USA'

# Products Table

ProductID	ProductName	SupplierID	CategoryID	Unit	Price
1	Chais	1	1	10 boxes x 20 bags	18
2	Chang	1	1	24 - 12 oz bottles	19
3	Aniseed Syrup	1	2	12 - 550 ml bottles	10
4	Chef Anton's Cajun Seasoning	2	2	48 - 6 oz jars	22
5	Chef Anton's Gumbo Mix	2	2	36 boxes	21.35
6	Grandma's Boysenberry Spread	3	2	12 - 8 oz jars	25
7	Uncle Bob's Organic Dried Pears	3	7	12 - 1 lb pkgs.	30
8	Northwoods Cranberry Sauce	3	2	12 - 12 oz jars	40
9	Mishi Kobe Niku	4	6	18 - 500 g pkgs.	97
10	Ikura	4	8	12 - 200 ml jars	31
11	Queso Cabrales	5	4	1 kg pkg.	21
12	Queso Manchego La Pastora	5	4	10 - 500 g pkgs.	38
13	Konbu	6	8	2 kg box	6
14	Tofu	6	7	40 - 100 g pkgs.	23.25
15	Genen Shouyu	6	2	24 - 250 ml bottles	15.5

# Question

Write query for all below questions on table Products

1. Select all products which are supplied by suppliers with Id 1 or 2 or 3
2. Fetch the name of all such products which have price in range 5 to 25
3. Find all suppliers who supply the products of category 2?
4. Find all products which are supplied by supplier of ID 2 with price more than 30?
5. Find all products which have price more than 50 but not supplied by supplier with ID 6?
6. Find all products which have price less than 30 but not supplied by supplier with ID 2 or 6?

# Happy Learning.!

