

dbms

Joints

→ To get the joins we should have
foreign key in it

As the name suggests Join means To combine something.

Join means combination of two or more tables.

Types:

1) Inner: It joins the records that have matching values in both tables as long as the condition is satisfied.

Select * from employee inner join project on employee.EMP-ID = project.EMP-ID → chooses or selects certain

employee.EMP-ID

a) left join:

It returns all the values from left table and the matching values from the right side table.

Select * from employee left join project on EMP-ID = employee.EMP-ID

3) Right join:

Right join it returns all the values from the rows of right table and the matched from left table.

Select * from employee right join project on project.emp-ID = Employee.EMP-ID

foreign key: It should not become null and there should be primary key in both tables and it should not be null.

4) Full join

In sql it returns all the rows from the tables
if there was no value it will give null

select * from Employee, EMPLOYEE, Project, EMPLOYEE
from Employee full join Project on Project.EmpID = Employee.EmpID

→ Physical level is the lowest level of abstraction of data.
It describes how data is actually stored in database.

→ If the common fields does not match in the database
then it is known as Data inconsistency.

→ Data integrity is nothing but overall completeness,
accuracy and consistency of data. This can be indicated
by the absence of alteration b/w two instances or b/w
two updates of data record, meaning data is
intact and unchanged.

→ Data isolation:
how transaction integrity is visible to other users
(and systems).

Data redundancy:-

when the same piece of data exists in multiple
places

Superkey:-

→ It is defined as set of attributes within a table, that can uniquely identify each record within a table.

Candidate key:-

→ These are the minimal sets of fields which can uniquely identify each record in table.

→ A candidate key cannot be null or empty and it should be unique.

→ There can be more than one candidate key.

→ A candidate key can be combination of more than one columns.

Primary key:-

→ It is the candidate key that is most appropriate to become the main key for any table.

→ It is a key that uniquely identifies each record.

Composite key:-

→ It consists of two or more attributes that uniquely identifies any record in a table is called composite key.

Secondary or Alternative key:-

The candidate key which are not selected as primary key we know as secondary keys.

Non-key attributes

non key attributes are the attributes or fields of a table other than candidate key attributes.

Fields in a table

Non-prime attributes

These are attributes other than primary key attributes.

Normalization

→ To reduce data redundancy



Same piece of data is held in two separate place in the same table

Anomalies

Insert: Attributes cannot insert with the presence of other attributes.

(or)

we tried to insert data in that record that data is not exist at all

Delete: exist when certain attributes lost because deletion of one attribute.

update! partial update because of data inconsistency

- normalisation is a method to remove all these anomalies & bring the database to a consistent state.
- with the help of keys & functional dependences of a relation to certify whether a relation schema is particular Normal Form.

2NF, 3NF, BCNF → based on keys & functional dependences of a relations schema.

4NF → based on keys & multivalued dependences.

Characteristics:-

- Scalar values in each field
- minimal use of null values
- Absence of redundancy
- minimal loss of information

1NF

- Property of relation in relational database.
- All attributes in a relation must have only atomic (indivisible) domains.

Requirements:

- ① Each table has primary key.
- ② The value in each column of a table are atomic. (no multi-value attr & array allowed)
- ③ There are no repeating groups.

(No columns do not store similar information in the same table).

decomposition:

- ① Place all items that appear in the repeating group in a new table.
- ② Designate a ^{primary key} PK for each new table produced.
- ③ Duplicate in the new table the PK of the table from which the repeating group was extracted or vice versa.

eg:

emp_id	emp_name	emp_phone	Empl-822
14	John	7272729463	UP
		4493929187	

14	John	7272729463	UP
		4493929157	JP
14	John		

→ It is used in small to medium size ~~applications~~
applications.

2nd Normal form

Primary prime attribute:-

An attribute which is a part of primary key is called Primary attribute.

~~Non P~~

requirements:-

- ① The database is in 1NF
- ② All non key attributes in table must be functionally dependent on primary key.

def:- every non prime attribute should be fully functional dependent on prime attribute
if $X \rightarrow A$ holds, then there should be no
be any proper subset Y of X , for which
 $Y \rightarrow A$ also holds true

derivation:-

- ① If a data item is fully F.D on only a part of P.K more than data item is part of primary key hence table.

- a) If other data items are FD on the same part
 of key then place them in new table
 b) Make the partial PK copied from original table
 the primary key for new table
 c) Place all items that appear in the repeating group
 in new table.

→ IN R. GFD. SULL.

→ When the Nonkey attribute is ~~not~~ functionally dependent
 on two or more attributes then it was fully functional
 dependent

Ex:-

studentId	ProjectId	studentName	Projections
S89	P09	olivia	Geolocation
S76	P07	Jacob	clustering
S56	P03	Ava	IoT devices
S92	P05	Alexandria	cloud deployment

Here student ID and ProjectID are the candidate keys and the student name was nonkey attribute which depends on studentID & ProjectID and also the projection name depends on ProjectID

so here we have to divide it into tables.
to have it in 3NF.

student-ID	Project ID	Student name
S89	P04	Olivia
S76	P07	Jacob
S58	P03	Ava
S92	P05	Alexandra

Project ID	Project name
P04	Geolocation
P02	Host exploration
P03	IoT devices
P05	Cloud deployment.

3NF is satisfied
→ The Non key attributes must be functional dependent on candidate key i.e., there can be no interdependences among non key attributes.

rules:-

- It should be in 3NF
- There is no transitive FD

$$A \rightarrow B$$

$$B \rightarrow C$$

$$A \rightarrow C$$

Eg: Book details

Book Id	GenreId	Genre type	Price
1	1	science	30
2	2	maths	35
3	1	science	25
4	3	physics	20
5	2	maths	30

BookId → GenreId

GenreId → Genertype

~~Genre~~

BookId → Genertype

BookId	GenreId	Price
1	1	30
2	2	35
3	1	25
4	3	20
5	2	30

GenreId	Genertype
1	science
2	maths
3	physics

} there we took only 3 because
as there was only 3 books

BCNF

Boyce-Codd Normal Form

II

3.5 NF (Advanced Version of
3NF)

→ It is a 3NF

→ For every functional dependencies $X \rightarrow Y$, X should be super key of table.

Std	course	Teacher
Pinky	DBMS	Priya
Lucky	DBMS	madhu
Deepu	COA	bhanu
bhanu	COA	bhanu
Jasvi	DBMS	madhu

Std	Teacher
Pinky	DBMS
Lucky	DBMS
Deepu	DBMS COA
bhanu	COA
Jasvi	DBMS

course	Teacher
DBMS	Priya
DBMS	madhu
COA	bhanu

C \Rightarrow Note equal to

UNF

Based on keys & multivalued dependencies.

→ UNF eliminates independent many-to-one relationships b/w columns

→ A deletion must be in BCNF

→ A given relation may not contain more than one multivalued attribute.

Postd	activity	Infostr
100	web	cyber
100	AI	cyber
100	web	blockchain
100	AI	block
		↓

1000 web
100 AI
100
100

distint

It is used in the select statement to retrieve unique from the table. It removes all the duplicates of records while returning

→ The usage of distinct keyword should be avoided to reduce the performance.

Between → will include 1000 and 2000

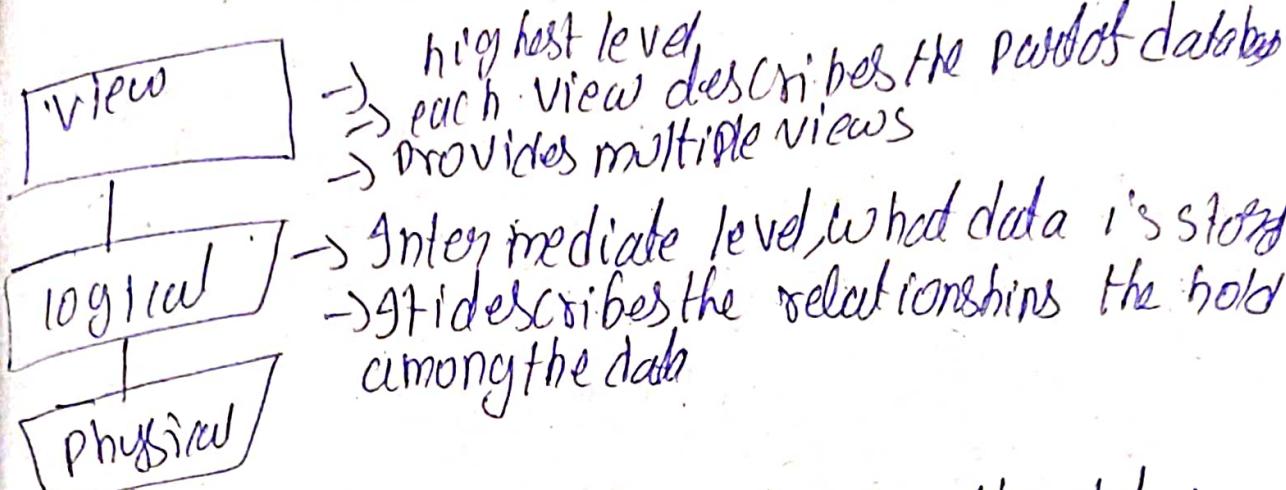
→ The maximum value of nothing in SQL is null

Instance: collection of information stored data

Particular moment is called instance

schema: overall description of database

is called schema



lowest level which describes how the data is stored that describes data structure

Cardinality: The no. of instances in the table

Degree: no. of columns

Table level unique constraint.

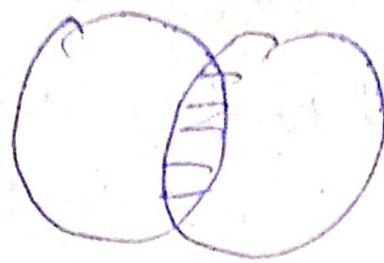
→ apply constraint to the columns we can add the constraint keyword

→ apply constraint keyword to the columns we have to apply separately.

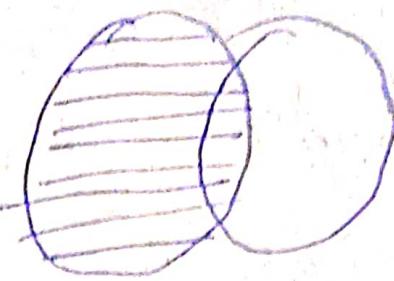
→ ~~when~~ sysdate is nothing but the system date.

→ Between operator can be replaced by AND and OR operation by OR.

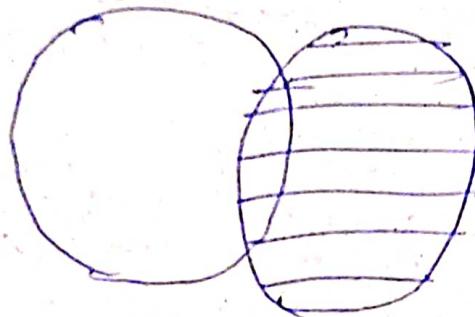
Inner join



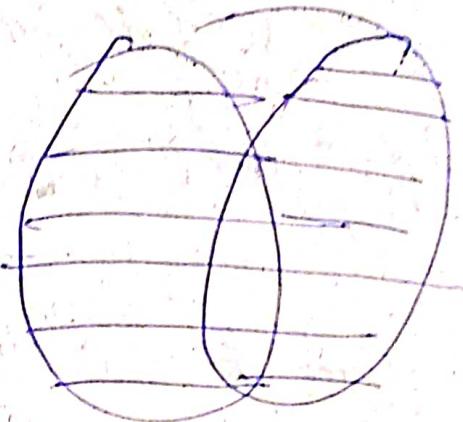
left outer join



Right outer join



full outer join



NVL → null value data we have to replace it with given table having null values
data independence

→ capacity of changing the schema at one level without affecting the other.

→ db are designed in multi layer.

→ db stores data about data known as meta data

→ logical data independence! (conceptual schema)

→ It follows logical schema.

→ It stores information how data is managed inside.

→ Ability to change logical schema without changing the external application program

Physical data independence! (internal schema)

→ It has the ability to change the physical data without impacting the logical data structure

e.g. change in internal schema, diff file

e.g. change organization, storage device structure