Attributes & Functional Dependency

Rohan Singh R

ATTRIBUTES IN SQL :

ATTRIBUTES : Are the properties which defines the entity

1. Key attribute / Candidate key : An attribute which is used to identify a record uniquely from a table is known as key attribute .
   Ex: Phone_No , mail_id , aadhar , pan , ration , passport , dl , bank a/c

2. Non key attribute : All the attributes other than key attributes .
   Ex : Name , age , gender , dob

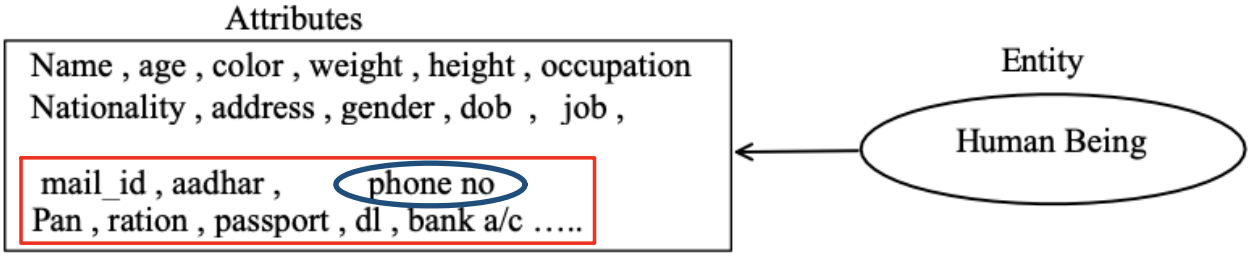
3. Prime key attribute : Among the key attributes an attribute is chosen to be the main attribute to identify a record uniquely from the table is known as prime key attribute .
   Ex: Phone_No .

4. Non-prime key attribute : All the key attributes other than Prime key attributes
   Ex : mail_id , aadhar , pan , ration , passport , dl , bank a/c

5. Composite key attribute : It is combination of two or more *non key attributes* which is used to identify a record uniquely from the table .
   > Composite key is found whenever there is no key attribute .
   Ex: (name , age , dob , address)

6. Super key attribute : It is a set of all key attributes .
   Ex: {Phone_No , mail_id , aadhar , pan , ration , passport , dl , bank a/c }

7. Foreign key attribute : It is an attributes which behaves as an attribute of another entity to represent the relationship .
   Ex: Dno



FUNCTIONAL DEPENDENCY :

"THERE EXISTS A DEPENECY SUCH THAT AN ATTRIBUTE IN A RELATION DETERMINES ANOTHER ATTRIBUTE ".

EID	ENAME

EMP - (*EID* , *ENAME*)

EID --> ENAME

1	A
2	B
3	A

TYPES OF FUNCTIONAL DEPENDENCIES :

1. TOTAL FUNCTIONAL DEPENDENCY
2. PARTIAL FUNCTIONAL DEPENDENCY
3. TRANSITIVE FUNCTIONAL DEPENDENCY

1. TOTAL FUNCTIONAL DEPENDENCY:

If an attribute in a relation determines all the other attributes it is known as TFD
OR If all the attributes are dependent on a single attribute the it is known as TFD

EMP - (EID , ENAME , SAL , DOB) EID * KEY ATTRIBUTE

EID - > ENAME
EID - > SAL
EID - > DOB
:- *EID* -> (ENAME , SAL , DOB)

2. PARTIAL FUNCTIONAL DEPENDENCY

There exists a dependency such that a part of composite key attributes determines another attribute uniquely .

CUSTOMER - (CNAME , ADDRESS , MAIL_ID , PHONE_NO)

(PHONE_NO , MAIL_ID) ---- Composite key attribute

PHONE_NO - > CNAME , ADDRESS
MAIL_ID - > CNAME , ADDRESS

Customer

CNAME	ADDRESS	MAIL_ID	PHONE_NO
Smith	Mysore	smith@gmail.com	
Miller	Bangalore		1001
Scott	Mangalore	scott@yahoo.com	
Adams	Mysore		2002
Scott	Delhi		3003

3. TRANSITIVE FUNCTIONAL DEPENDENCY

There exists a dependency such that an attribute is determined by a non-key attribute , which is intern determined by a key attribute .

X - (A , B , C , D)

A - > B
A - > D
D - > C

A * *KEY ATTRIBUTE*

A = B
B = C
A = C

CUSTOMER - (CID , CNAME , PINCODE , STATE)

CID ->CNAME
CID->PINCODE
PINCODE -> STATE

Redundancy : *The repetition of unwanted data is known as redundancy .*

Anomaly : *The side effects caused during DML operations is known as Anomaly.*

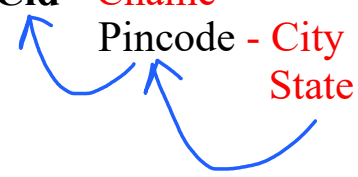
TOTAL	PARTIAL	TRANSITIVE
No Redundancy	Redundancy Exists	Redundancy Exists
No Anomalies	Anomalies are Present	Anomalies are Present

Customer

CID	CNAME	PINCODE	CITY	STATE
1	Smith	510001	Bangalore	Karnataka
2	Miller	510002	Mumbai	Maha
3	Scott	510001	Bangalore	Karnataka
4	Adams	510001	Bangalore	Karnataka
5	Scott	510002	Mumbai	Maha

Customer : (**cid** , cname , pincode , city , state)

(PK)Cid- Cname
Pincode - City
State



R1 - (**Cid** , Cname , Pincode)
R2 - (**Pincode** , City , State)

R1

CID	CNAME	PINCODE(fk)
1	Smith	510001
2	Miller	510002
3	Scott	510001
4	Adams	510001
5	Scott	510002

R2

PINCODE	CITY	STATE
510001	Bangalore	Karnataka
510002	Mumbai	Maha