SQL KEYS

TABLE CONTENTS

WHAT IS A KEY?

- SQL Keys are one of the attributes of the relational database.
- Which plays an important role to establish a relationship between two or more tables.
- SQL keys can either be defined as a single column or a group of columns (attributes) leveraged to uniquely locate records in a table.
- It also helps queries to execute faster i.e. retrieval of the records from the database becomes much faster by using Keys.
- Keys also set different constraints to uniquely identify the tuples from the large data.

TYPES OF KEYS

Relational Database Keys have various forms of constraint to conform to such as columns, which cannot hold duplicate values or null values.

The various SQL Keys are:

- Primary Key
- Unique Key
- Candidate Key
- Alternate Key
- Composite Key
- Super Key
- Foreign Key

EXAMPLE:

Customer Table				
cust_id	**cust_name**	**cust_address**	**cust_aadhaar_no**	**cust_pan_no**
100001	Sunil Kumar	Noida	372464389211	ADSFS3456K
100002	Ankit Gupta	Gr Noida	442289458453	CGHAD7583L
100003	Suresh Yadav	New Delhi	878453444144	NMKRT2278O
100004	Nilam Singh	Lucknow	227643441123	HFJFD3876U
100005	Amal Rawat	Ghaziabad	932571156735	CBMVA9734A
100006	Harsh Saxena	Kanpur	1453534363319	TRYUC2568H

EXAMPLE:

Order Table			
order_id	**cust_id**	**order_month_year**	**order_amount**
23001	100001	2019 – Jan	$100,000
23002	100002	2019 – Jan	$120,000
23003	100003	2019 – Jan	$100,000
23004	100004	2019 – Jan	$110,000
23005	100001	2019 – Feb	$105,000
23006	100002	2019 – Feb	$125,000

1) PRIMARY KEY

- Primary Key is a field that can be **used to identify all the tuples uniquely** in the database.
- Tables can have **only one primary key**, it can be a single column or multiple columns together.
- A Primary Key can **not** have a **NULL** value.
- For each entity, the primary key selection is based on requirements and developers.

Example: In the above given relational table, **“cust_id”** is the Primary Key as it can identify all the rows uniquely from the table.

2) UNIQUE KEY

- Unique Key can be a field or set of fields that can be used to uniquely identify the tuple from the database.
- **One or more fields** can be declared as a unique Key.
- The unique Key column can also hold the NULL value.
- Use of a Unique Key improves the performance of data retrieval. It makes searching for records from the database much more faster & efficient.

Example: In the above given relational table, **“cust_aadhaar_number”** and **“cust_pan_number”** are the Unique Keys, also it can allow one value as a NULL in the each column.

3) CANDIDATE KEY

- Candidate Key can be a column or group of columns that can qualify for the **Unique Key**.
- Every table has at least one Candidate Key. A table may have **one or more Candidate Key**.
- Each Candidate Key can work as a Primary Key if required in certain scenarios.

Example: In the above given relational table, **“cust_id”, “cust_aadhaar_number”, “cust_pan_number”** are the Candidate Key as it can identify all the row uniquely from the table. These columns also qualify the criteria to be a Primary Key.

4) ALTERNATE KEY

- Alternate Key is that Key which can be used as a Primary Key if required.
- Alternate Key also qualifies to be a Primary Key but for the time being, It is not the Primary Key.

Example: In the above given relational table, **“cust_aadhaar_number”, “cust_pan_number”** are the Alternate Key as both of the columns can be a Primary Key but not yet selected for the Primary Key.

5) COMPOSITE KEY

- Composite Key is also known as **Compound Key / Concatenated Key**.
- Composite Key refers to a **group of two or more columns** that can be used to **identify** a tuple from the table **uniquely**.
- **A group of the column in combination** with each other can identify a row uniquely but a single column of that group doesn't promise to identify the row uniquely.

Example: In the above given relational table i.e**. Order Table, "cust_id", "order_month_year"** group of these columns **used in combination to identify the tuple uniquely** in the Order Table. The individual column of this table is not able to identify the tuple uniquely from the Order table.

6) SUPER KEY

- Super Key is a **combination of columns**, each column of the table remains **dependent** on it.
- Super Key is an attribute (or set of attributes) that is used to uniquely identifies all attributes in a relation.
- Super Key may have some more columns in the group which **may or may not** be necessary to identify the tuple uniquely from the table.
- Candidate Key is the **subset** of the Super Key. Candidate Key is also known as **minimal Super Key**.

Example:

- In the above given relational table, **Primary Key, Candidate Key & Unique Key is the Super Key**.
- As a single column of Customer Table i.e 'cust_id' is sufficient to identify the tuples uniquely from the table.

7) FOREIGN KEY

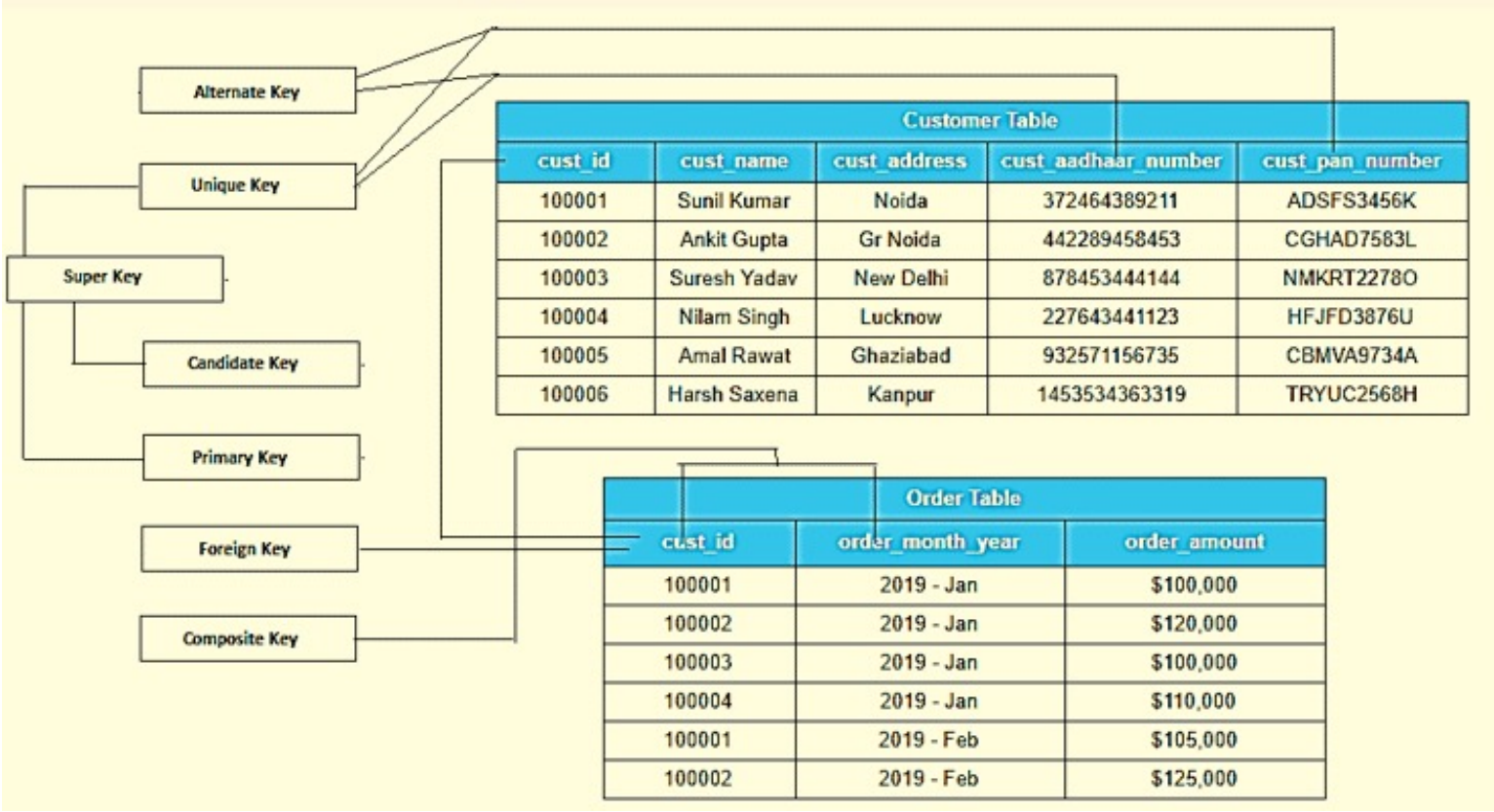
- A foreign key is a column which is known as **Primary Key in the other table** i.e. A Primary Key in a table can be referred to as a Foreign Key in another table.
- Foreign Key **may have duplicate & NULL values** if it is defined to accept NULL values.
- Foreign Key in a table always becomes the Primary Key on the other table.

Example: In the above given relational table, **'cust_id'** is *Primary Key* in the **Customer table** but **'cust_id'** in the **Order table** known as a *'Foreign Key*'.

SALIENT POINTS KEYS

- **Candidate keys** are a subset of **Super keys**. They contain only those attributes or set of attributes which are required to uniquely identify tuples.
- A primary key is basically a type of candidate key. A candidate key may or may not be a type of primary key.
- All **Candidate keys** are **Super keys**. But the vice-versa is not true.
- Adding zero or more attributes to the candidate key generates the super key.
- There can be more than one candidate key in relation out of which one can be chosen as the primary key.
- The candidate key other than the primary key is called an alternate key.
- **Composite Key**: Sometimes, a table might not have a single column/attribute that uniquely identifies all the records of a table. In order to uniquely identify rows of a table, a combination of two or more columns/attributes can be used.

EXAMPLE: TYPE OF KEYS



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Thank You