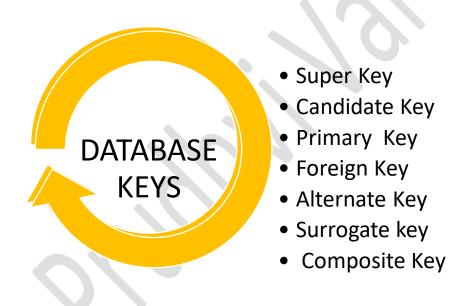


A key is an attribute or group of attributes that uniquely identifies a tuple (row) in a table.

♣ Keys play an important role in preserving a database's integrity and dependability by imposing unique limitations on the data and creating linkages across tables.

#### **DATABASE KEY TYPES:**



# 1. Super Key

A Super key is a **column combination** that **uniquely identifies any row** in a relational database management system (RDBMS) table.

Here are some examples of super keys:

- In a table of students, the combination of student ID and student name is a super key.
- In a table of employees, the combination of employee ID and employee name is a super key.
- In a table of products, the combination of product ID and product name is a super key.

### 2. Candidate Key

It is the smallest collection of characteristics that may be used to uniquely identify a tuple (row) in the database.

To put it another way,

In general, any column or combination of columns that can uniquely identify a row in a table is a candidate key.

Here are some of the important properties of candidate keys:

- Uniqueness: A candidate key must be unique for each row in the table.
- Non-null: A candidate key cannot be null.
- Minimality: A candidate key cannot be reduced to a smaller set of attributes that still uniquely identifies each row in the table.

## 3. Primary Key

A primary key is a **tuple's unique identifier in a table**. A table can only have one primary key, and it **cannot include null values**.

♣ Primary keys are an important concept in database design. They help to ensure the uniqueness and integrity of data in a database.

#### Here are some of the benefits of using primary keys:

\*Uniqueness: Primary keys ensure that each row in a table is unique. This makes it easier to identify and access specific rows of data.

\*Integrity: Primary keys help to maintain the integrity of data in a database. By preventing duplicate data and ensuring that each row has a unique identifier, primary keys help to keep data accurate and consistent.

\*Relationships: Primary keys can be used to establish relationships between tables in a database. This allows you to link data from different tables together, which can be useful for queries and reporting.

## 4. Foreign Key

A foreign key is a field or column in one table that **references the primary key of another table.** 

♣ Foreign keys are used to establish relationships between tables in a database

To put it another way,

- **♣** A Foreign key is a primary key from one table that is used to connect to another.
- ♣ Foreign keys are an important tool for database design.
- By using foreign keys, you can help to ensure the accuracy, consistency, and integrity of your data.

#### Here are some of the benefits of using foreign keys:

\*Accuracy: Foreign keys help to ensure the accuracy of data in a database by preventing duplicate data and ensuring that the values in a foreign key are always present and match the values in the primary key of the referenced table.

\*Consistency: Foreign keys help to maintain the consistency of data in a database by preventing changes to the values in a primary key from being propagated to the values in the foreign key.

\*Relationships: Foreign keys can be used to establish relationships between tables in a database. This allows you to link data from different tables together, which can be useful for queries and reporting.

### 5. Alternate Key

An alternate key is a candidate key that is not used as the primary key.

♣ It can be useful for establishing relationships between tables or
for creating unique indexes on tables

To put it another way,

♣ A candidate key that is not utilized as the primary key is known as an alternative key.

Here are some examples of how alternate keys can be used to improve database design:

 To prevent duplicate data: Alternate keys can be used to prevent duplicate data in a table.

- **To maintain data integrity**: Alternate keys can be used to maintain data integrity in a table.
- To establish relationships between tables: Alternate keys can be used to establish relationships between tables.
- **To improve performance**: Alternate keys can be used to improve the performance of queries.

### 6. Surrogate Key

A surrogate key is a **unique identifier** for a row in a database that is not derived from any other data in the database.

- ♣ Surrogate keys are often used as primary keys in databases because they are guaranteed to be unique and they do not change over time.
- Surrogate keys are also known as synthetic keys, artificial keys, or technical keys

The following are some of the benefits of employing surrogate keys

- \* Surrogate keys are guaranteed to be unique, which can aid in the prevention of **duplicate data**.
- \* Surrogate keys do not change over time, which can help to preserve data consistency.
- \* Surrogate keys can be used to construct unique indexes, which can enhance query performance.

## 7. Composite Key

A composite key is a **primary key that is composed of two or more attributes.** When a single attribute is not enough to uniquely identify a row in a table, a composite key can be used.

To put it another way,

- ♣ A composite key is a main key composed of two or more characteristics.
- ♣ When a single characteristic is insufficient to uniquely identify a tuple in a table, a composite key can be used.

Here are some more advantages of using composite keys:

- **Uniqueness**: Composite keys are guaranteed to be unique, which can help to prevent duplicate data.
- **Consistency**: Composite keys do not change over time, which can help to maintain the consistency of data.
- **Performance**: Composite keys can be used to create unique indexes, which can improve the performance of queries.
- Meaningfulness: Composite keys can be meaningful, which can make them easier to use in queries and reports.