

Keys

Primary Key (PK)

A primary key is a column or a combination of columns that uniquely identifies each record in a table.

It ensures data integrity by preventing duplicate entries.

A table can have only one primary key.

Example:

```
CREATE TABLE students (  
    student_id INT PRIMARY KEY,  
    first_name VARCHAR(50),  
    last_name VARCHAR(50),  
    email VARCHAR(100)  
);
```

Foreign Key (FK)

A foreign key is a column or a combination of columns that references the primary key of another table.

It establishes a link between two tables, enforcing referential integrity.

Example:

```
CREATE TABLE enrollments (  
    enrollment_id INT PRIMARY KEY,  
    student_id INT,  
    course_id INT,  
    FOREIGN KEY (student_id) REFERENCES students(student_id),  
    FOREIGN KEY (course_id) REFERENCES courses(course_id)  
);
```

Superkey (SK)

A superkey is a combination of one or more columns that uniquely identifies each record in a table.

Every superkey contains a candidate key.

Example:

In the students table, (student_id, first_name, last_name) can be a superkey since it uniquely identifies each student.

Candidate Key (CK)

A candidate key is a superkey with no redundant columns.

It uniquely identifies each record in a table, and all its columns are necessary for the uniqueness.

A table can have multiple candidate keys, and one of them is chosen as the primary key.

Example:

In the students table, student_id and email can be candidate keys.

Composite Key

A composite key is a primary key or a candidate key that consists of two or more columns.

It is used when no single column can uniquely identify each record.

Example:

```
CREATE TABLE orders (  
    order_id INT,  
    product_id INT,  
    customer_id INT,  
    PRIMARY KEY (order_id, product_id)  
);
```

NonPrime Attribute

A nonprime attribute is a column or columns that are not part of any candidate key. These attributes depend on the primary key for their values.

Example:

In the students table, first_name and last_name are nonprime attributes since they depend on the student_id for their values.

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