

KEYS IN DATABASE:

- keys are like road signs for your database. They help the database organize and find data quickly.
- Imagine you have a huge library with thousands of books. Keys are like the index that tells you exactly where to find each book.

Importance of Keys:

Uniqueness

Fast Retrieval

Data Relationships



■ Types of keys in DBMS

Key plays an important role in relational database; it is used for identifying unique rows from table & establishes relationship among tables on need.



- **1. Primary Key** – A primary key is a unique identifier for each record in a table. It uniquely identifies each row and ensures that there are no duplicate entries. Here's an example:

Roll No.	Name	Age	Grade
1	John	16	A
2	Lisa	17	A
3	Michael	16	B

Table: Students

In this example, the "Roll No." column serves as the primary key. Each student has a unique roll number, and it is used to identify them uniquely.

```
CREATE TABLE Employees (  
    EmployeeID INT PRIMARY KEY,  
    FirstName VARCHAR(50),  
    LastName VARCHAR(50)  
);
```

Example: Consider a table named "Employees" where each employee has a unique employee ID

2.Foreign Key: A foreign key is a field in a table that refers to the primary key of another table. It establishes a relationship between two tables. Here's an example:

Table: Courses

Course ID	Course Name	Instructor
101	Math	Mr. Smith
102	Science	Mrs. Johnson
103	History	Mr. Davis

In this example, the "Course ID" column in the "Enrollments" table is a foreign key.

Table: Enrollments

Student ID	Course ID
1	101
1	102
2	101
3	103

It references the primary key "Course ID" in the "Courses" table, establishing a relationship between the two tables.

```
CREATE TABLE Orders (  
  OrderID INT PRIMARY KEY,  
  CustomerID INT,  
  OrderDate DATE,  
  FOREIGN KEY (CustomerID) REFERENCES Customers(CustomerID)  
);
```

Example: In a "Orders" table, you can use a foreign key to reference the "CustomerID" from a "Customers" table to show which customer placed the order.

3.Unique Key: A unique key ensures that the values in a column or set of columns are unique and cannot be duplicated.

```
CREATE TABLE Products (  
  ProductID INT PRIMARY KEY,  
  ProductCode VARCHAR(20) UNIQUE,  
  ProductName VARCHAR(100),  
  Price DECIMAL(10, 2)  
);
```

Example: In a "Products" table, you can use a unique key on the "ProductCode" column to ensure that product codes are unique, but allow for NULL values in other columns.

Table: Employees

Employee ID	Name	Email
1	John	john@example.com
2	Lisa	lisa@example.com
3	Michael	michael@example.com

In this example, the "Employee ID" column serves as the primary key. However, the "Email" column can also be marked as a unique key to ensure that no two employees have the same email address.