

The primary key and foreign key are both essential concepts in relational database design, but they serve different purposes:

### **Primary Key:**

- A primary key is a unique identifier for a record within a table. Each table can have only one primary key.
- It must be unique for each record in the table, meaning no two rows can have the same primary key value.
- It cannot contain NULL values; every record must have a value for the primary key.
- It ensures each record in the table can be uniquely identified and retrieved.

### **Foreign Key:**

- A foreign key is a field (or set of fields) in one table that refers to the primary key of another table.
- It does not need to be unique; multiple records in the referencing table can have the same foreign key value.
- It can contain NULL values, meaning that not every record in the referencing table needs to have a corresponding record in the referenced table.
- It establishes and enforces a relationship between tables, ensuring referential integrity by linking records across tables.

the primary key ensures the uniqueness of records within a table, while the foreign key maintains relationships and consistency between records in related tables.