What is primary key?

A **primary key** is a unique identifier for each record in a database table. It ensures that each entry in the table can be uniquely identified, making it crucial for organizing and managing data.

Characteristics of a Primary Key:

1. **Unique**: Two rows in a table can't have the same value.

2. **Not-null**: The primary key field(s) cannot contain NULL values.

Example:

> In a "Students" table, the "StudentID" column might be set as the primary key because each student has a unique ID. This prevents duplicate records and allows each student to be identified separately.

What is Foreign Key and why it is needed?

A **foreign key** is a field in one table that creates a link between two tables by referencing the primary key in another table. This establishes a relationship between the two tables and ensures data consistency and integrity.

Why Foreign Keys are Needed:

1. **Create Relationships**: Foreign keys help define relationships between tables, which is essential in a relational database. For example, a "CustomerID" foreign key in the "Orders" table links each order to a specific customer in the "Customers" table.

2. **Manage Data Integrity**: Foreign keys enforce referential integrity, meaning a foreign key value must match a primary key value in the referenced table. This prevents orphaned records and keeps data consistent.

3. **Reduce Redundancy**: By linking tables instead of duplicating data, foreign keys help minimize data redundancy, improving database efficiency and organization.