Primary Key

- **Definition**: A primary key is a unique identifier for a record in a table. It ensures that each record can be uniquely identified by this key.
- **Uniqueness**: The value of a primary key must be unique across the entire table; no two rows can have the same primary key value.
- **Nullability**: A primary key cannot have a null value. Every record must have a valid primary key value.
- **Purpose**: The primary key's main purpose is to uniquely identify a row within its own table. It ensures data integrity by preventing duplicate records and ensuring that each row is distinct.
- **Example**: In a table of employees, an `EmployeeID` column could be used as a primary key. Each `EmployeeID` would be unique to each employee.

Foreign Key

- **Definition**: A foreign key is a column or a set of columns in one table that refers to the primary key of another table. It establishes and enforces a link between the data in the two tables.
- **Uniqueness**: Foreign key values do not have to be unique. Multiple records in the referencing table can have the same foreign key value.
- **Nullability**: Foreign keys can have null values, depending on the design and business rules. A null value in a foreign key column means that the relationship is optional.
- **Purpose**: The foreign key's main purpose is to ensure referential integrity between tables. It guarantees that the value in the foreign key column corresponds to a valid value in the referenced table’s primary key column.
- **Example**: In a table of orders, an `EmployeeID` column might serve as a foreign key that refers to the `EmployeeID` column in the employees' table. This indicates which employee is associated with each order.