PRIMARY KEY vs UNIQUE + NOT NULL (with Use Case Comparison)

Aspect	PRIMARY KEY	UNIQUE + NOT NULL
Definition	Uniquely identifies **each row** and represents the **table's identity**.	Ensures a column value is **unique and mandatory**, but does not define row identity.
NULL Handling	NULL values are **not allowed** because identity must always exist.	NULL values are **not allowed** due to NOT NULL constraint.
Uniqueness	Enforces uniqueness as the **primary identifier** of the table.	Enforces uniqueness as a **business rule**.
Number Allowed per Table	**Only one**, since a table can have only one identity.	**Multiple** such constraints can exist.
Purpose / Meaning	Defines **who the row is** in the table.	Defines **rules the row must follow**.
Foreign Key Usage	**Ideal and recommended** target for foreign keys in other tables.	Can be referenced, but **not recommended** for main relationships.
Index Creation	Automatically creates a **unique index** for fast access.	Automatically creates a **unique index** as well.
Data Modeling Role	Represents the **entity identifier** in relational modeling.	Represents an **alternate key** or constraint.
Typical Columns	ID, EMP_ID, ORDER_ID, CUSTOMER_ID	EMAIL, USERNAME, SSN, ACCOUNT_NO
Primary Use Case	When a column is required to **identify and relate records** across tables.	When a column must be **unique and always present**, but is not the main ID.
Real-World Use Case	Linking ORDERS to CUSTOMERS, EMPLOYEES to DEPARTMENTS.	Preventing duplicate EMAIL or USERNAME during registration.
Design Best Practice	**Always use** for table identity and relationships.	Use for enforcing **business uniqueness rules**.