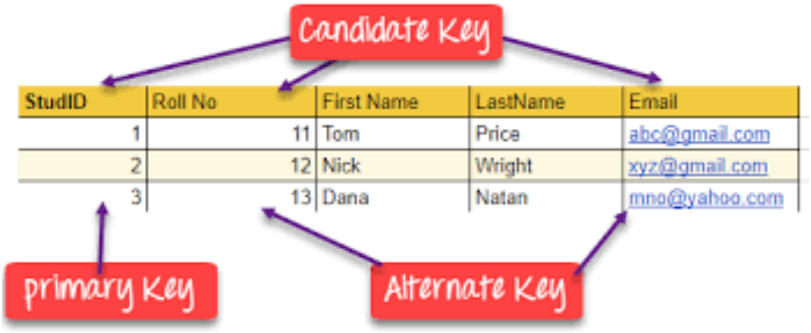
Keys



- A key in SQL is an attribute or **set of attributes** which helps you to **identify a row(tuple)** in a relation(table)
- DBMS keys allow to establish a relationship between and identify the relation between tables
- Several Types of DBMS keys in DBMS.
- A **super key** is a **group of single or multiple keys** which identifies rows in a table.
- A super key with no repeated attribute is called **candidate key**:
  - The **minimal set of attribute** which can uniquely identify a tuple is known as candidate key.

- **Primary Key:**
  - A column (i.e. attribute) or group of columns in a table which helps us to uniquely identifies every row in that table is called a primary key
  - There can be more than one candidate key in relation out of which one can be chosen as the primary key.
  - Eg, In the example below,
    - STUD_NO, STUD_AGE both, are candidate keys for relation STUDENT but STUD_NO can be chosen as the primary key (only one out of many candidate keys).
    - Can STUD_PHONE be a primary key?
  - Primary keys **must** contain **unique** values.
  - A primary key column **cannot** have **NULL values**.

- All the keys which are **not primary key** are called an **alternate key.**
- A key which has **multiple attributes to uniquely identify rows** in a table is called a **composite key**

STUDENT

STUD_NO	STUD_NAME	STUD_PHONE	STUD_STATE	STUD_COUNTRY	STUD_AGE
1	RAM	9716271721	Haryana	India	20
2	RAM	9898291281	Punjab	India	19
3	SUJIT	7898291981	Rajsthan	India	18
4	SURESH		Punjab	India	21

Table 1

STUDENT_COURSE

STUD_NO	COURSE_NO	COURSE_NAME
1	C1	DBMS
2	C2	Computer Networks
1	C2	Computer Networks

Table 2

- **Foreign Key:**
  - links between data in two tables.
  - **cross-reference between tables**
    - as it references the primary key of another table (i.e. parent table).
  - A foreign key references a column of another table.
  - **Main Purpose**: ensure **referential integrity** of the data.
    - Ensures values that are permitted.
    - when a foreign key value is used it must reference a valid, existing primary key in the parent table.
  - Eg: **STUD_NO in table STUDENT_COURSE is a foreign key**
  - Primary key must have not-null values while **a foreign key may accept null values.**

No.	PRIMARY KEY	FOREIGN KEY
1	Primary key is a column or combination of columns that uniquely defines a row in a table of a relational database.	Foreign key is an attribute of table reference as Primary key in another table
2	Primary keys enforce entity integrity by uniquely identifying entity instances.	Foreign keys enforce referential integrity by completing an association between two entities.
3	Primary key is unique key	foriegn key always refers to primary key
4	Cannot be NULL	Can be NULL

https://www.guru99.com/dbms-keys.html
https://www.geeksforgeeks.org/difference-between-primary-key-and-foreign-key/