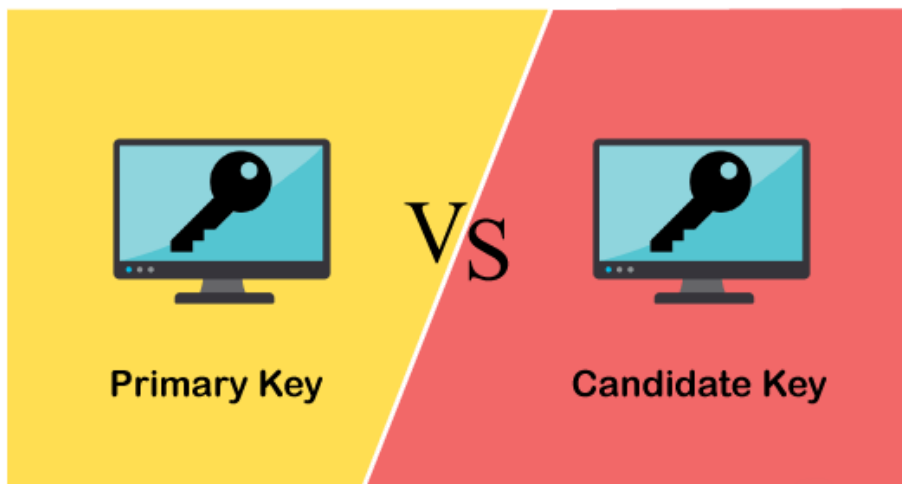


# Difference between Primary Key and Candidate Key

Keys in MySQL are an attribute or a set of attributes used to access records from tables. They are also used to construct a relationship between two tables. Both Primary and Candidate Key identifies each record uniquely in a table or relation. **The most popular difference among them is that a table can have only one primary key but can have more than one candidate key.** In this article, we are going to compare essential differences between Primary and Candidate Keys based on various parameters. Before making a comparison, we will discuss in brief about these keys.



## What is Primary Key?

The **primary key** is a **unique or not-null** key that uniquely identifies each record in a table or relation. It is a minimal super key; that's why it can contain only one primary key in any relationship. **For example**, suppose we have a table named **students** with ID, Name, Age, and Address columns. Here we can make only the ID column a primary key because all other column values can be the same, but the ID column can't be the same.

## What is Candidate Key?

A candidate key is an attribute or a set of attributes that identify each record in a table or relation uniquely but noted that a table could contain multiple candidate keys. This key can store a **NULL** value that opposes in a primary key. **For example**, suppose we have a table named **students** with ID, Name, DOB, Age, and Address columns. Here we can figure out two candidate keys that are {ID} and {Name, DOB}. Hence, it clarifies that more than one candidate key is available to identify the table or relation uniquely.

Since a table or relation can have more than one candidate key, one candidate key can qualify to become a primary key out of all candidate keys. Note that each candidate key can be a primary key, but only one should be chosen as the primary key. The rule to become a primary key among candidate keys is that the key's attribute values must be unique and can never be Null for any domain.

## Key differences between Primary and Candidate Key

The following points explain the main differences between primary and candidate keys:

- The primary key is a unique and essential attribute of a table or relation. In contrast, the candidate keys have many candidates, among which one candidate key can be selected as a primary key.
- The fundamental difference among both keys is that a table or relation in a schema can have only **one primary key**, but there can be **multiple candidate keys**.
- It is not mandatory to define a primary key, but there cannot be a relationship without the candidate key.
- The primary key attribute can **never** be a NULL because its main function is to identify a record in a table or relation uniquely. We can also use the primary key as a foreign key in other relations. Therefore, it cannot be NULL. This feature helps in finding the records in a referenced relation. The candidate key can be NULL unless the attribute constraint is specified as not-null.
- Each primary key can be a candidate key, but vice-versa is not possible.

## Primary Key vs. Candidate Key Comparison Chart

The following comparison chart explains their main differences in a quick manner:

Comparison Basis	Primary Key	Candidate Key
<b>Definition</b>	It is a unique and non-null key to identify each table's records in a schema uniquely.	It is also a unique key to identify records in relation or table uniquely.
<b>Basic</b>	A table or relation can contain only one primary key.	A table or relation can have more than one candidate key.
<b>NULL</b>	Any column of a primary key cannot be NULL.	The column of a candidate can contain a NULL value.
<b>Objective</b>	It is the essential part of a table or relation.	It signifies which key can be used as a primary key.

<b>Use</b>	It can be used as a candidate key.	It may or may not be used as a primary key.
<b>Specify</b>	It is not mandatory to specify a primary key for any relation.	There cannot be a relationship without specifying the candidate key.
<b>Example</b>	Consider a table " <b>student</b> " with columns (roll_no., name, class, DOB, email, mobile). Here <b>roll_no</b> column can be a primary key for the relationship because it identifies the student's records uniquely.	The <b>roll_no</b> , <b>mobile</b> , and <b>email</b> columns can be candidate keys in the given table because they can uniquely identify student's records.

## Conclusion

In this article, we have made a comparison between primary and candidate key. Here we conclude that it is optional to specify a primary key for a relation. But if we are declaring a relationship, candidate keys must be present in that relation.

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