**A non-prime** is an attribute that does not form part of primary key or candidate key.

A **candidate key** is a combination of attributes that uniquely identify a database record without referring to any other data. Each table may have one or more **candidate**. One of these **candidate keys** is selected as the table primary **key**.

A **superkey** is a combination of columns that uniquely identifies any row within a relational database management system (RDBMS) table. A candidate key is a closely related concept where the **superkey** is reduced to the minimum number of columns required to uniquely identify each row.

**First normal form** (**1NF**) is a property of a [relation](https://en.wikipedia.org/wiki/Relation_%28database%29) in a [relational database](https://en.wikipedia.org/wiki/Relational_database). A relation is in first normal form if and only if the [domain](https://en.wikipedia.org/wiki/Data_domain) of each [attribute](https://en.wikipedia.org/wiki/Column_%28database%29) contains only [atomic](https://en.wikipedia.org/wiki/First_normal_form#Atomicity) (indivisible) values, and the value of each attribute contains only a single value from that domain.[[1]](https://en.wikipedia.org/wiki/First_normal_form#cite_note-1) The first definition of the term, in a 1971 conference paper by [Edgar Codd](https://en.wikipedia.org/wiki/Edgar_F._Codd), defined a relation to be in first normal form when none of its domains have any sets as elements.[[2]](https://en.wikipedia.org/wiki/First_normal_form#cite_note-2)

First normal form is an essential property of a relation in a relational database. [Database normalization](https://en.wikipedia.org/wiki/Database_normalization) is the process of representing a database in terms of relations in standard normal forms, where first normal is a minimal requirement.

First normal form enforces these criteria:[[*citation needed*](https://en.wikipedia.org/wiki/Wikipedia%3ACitation_needed)]

* Eliminate repeating groups[[*clarification needed*](https://en.wikipedia.org/wiki/Wikipedia%3APlease_clarify)] in individual tables
* Create a separate table for each set of related data[[*definition needed*](https://en.wikipedia.org/wiki/Wikipedia%3APlease_clarify)]
* Identify each set of related data with a [primary key](https://en.wikipedia.org/wiki/Primary_key)

**Second normal form** (**2NF**) is a [normal form](https://en.wikipedia.org/wiki/Database_normalization#Normal_forms) used in [database normalization](https://en.wikipedia.org/wiki/Database_normalization). 2NF was originally defined by [E. F. Codd](https://en.wikipedia.org/wiki/E._F._Codd) in 1971.[[1]](https://en.wikipedia.org/wiki/Second_normal_form#cite_note-Codd-1)

A relation is in the second normal form if it fulfills the following two requirements:

1. It is in [first normal form](https://en.wikipedia.org/wiki/First_normal_form).
2. It does not have any [non-prime attribute](https://en.wikipedia.org/wiki/Non-prime_attribute) that is [functionally dependent](https://en.wikipedia.org/wiki/Functional_dependency) on any [proper subset](https://en.wikipedia.org/wiki/Proper_subset) of any [candidate key](https://en.wikipedia.org/wiki/Candidate_key) of the relation. **A non-prime attribute of a relation** is an attribute that is not a part of any candidate key of the relation.

Put simply, a relation is in 2NF if it is in 1NF and every non-prime attribute of the relation is dependent on the whole of every candidate key. Note that it does not put any restriction on the non-prime to non-prime attribute dependency. That is addressed in [third normal form](https://en.wikipedia.org/wiki/Third_normal_form).

**Third normal form** (**3NF**) is a [normal form](https://en.wikipedia.org/wiki/Database_normalization#Normal_forms) that is used in [normalizing](https://en.wikipedia.org/wiki/Database_normalisation) a [database](https://en.wikipedia.org/wiki/Database) design to reduce the duplication of data and ensure [referential integrity](https://en.wikipedia.org/wiki/Referential_integrity) by ensuring that:

1. The entity is in [second normal form](https://en.wikipedia.org/wiki/Second_normal_form).
2. No non-prime (non-key) attribute is [transitively dependent](https://en.wikipedia.org/wiki/Transitive_dependency) on any key i.e. no non-prime attribute depends on other non-prime attributes. All the non-prime attributes must depend only on the [candidate keys](https://en.wikipedia.org/wiki/Candidate_key).

3NF was designed to:[[1]](https://en.wikipedia.org/wiki/Third_normal_form#cite_note-1)

* eliminate undesirable data anomalies;
* reduce the need for restructuring over time;
* make the data model more informative;
* make the data model neutral to different kinds of query statistics.

Codd later realized that 3NF did not achieve the first of these goals and developed [Boyce–Codd normal form](https://en.wikipedia.org/wiki/Boyce%E2%80%93Codd_normal_form) to address the limitations of 3NF.

**Boyce–Codd normal form** (or **BCNF** or **3.5NF**) is a [normal form](https://en.wikipedia.org/wiki/Database_normalization#Normal_forms) used in [database normalization](https://en.wikipedia.org/wiki/Database_normalization). It is a slightly stronger version of the [third normal form](https://en.wikipedia.org/wiki/Third_normal_form) (3NF). BCNF was developed in 1974 by [Raymond F. Boyce](https://en.wikipedia.org/wiki/Raymond_F._Boyce) and [Edgar F. Codd](https://en.wikipedia.org/wiki/Edgar_F._Codd) to address certain types of anomalies not dealt with by 3NF as originally defined.[[1]](https://en.wikipedia.org/wiki/Boyce%E2%80%93Codd_normal_form#cite_note-Codd-1)

If a [relational schema](https://en.wikipedia.org/wiki/Database_schema) is in BCNF then all redundancy based on [functional dependency](https://en.wikipedia.org/wiki/Functional_dependency) has been removed, although other types of redundancy may still exist. A relational schema *R* is in Boyce–Codd normal form [if and only if](https://en.wikipedia.org/wiki/If_and_only_if) for every one of its [dependencies](https://en.wikipedia.org/wiki/Functional_dependency) *X → Y*, at least one of the following conditions hold:[[2]](https://en.wikipedia.org/wiki/Boyce%E2%80%93Codd_normal_form#cite_note-2)

* *X → Y* is a trivial functional dependency (Y ⊆ X),
* *X* is a [superkey](https://en.wikipedia.org/wiki/Superkey%22%20%5Co%20%22Superkey) for schema *R*.