Here, we will discuss **data normalization** and its three steps, which will categorize columns representing one kind of information in one table, so that no anomalies occur in a database. These steps are as follows:

* Step 1: Converting a given table to the **1st Normal Form(1NF)**
* Step 2: Converting the table from 1NF to the **2nd Normal Form (2NF)**
* Step 3: Converting the table from 2NF to the **3rd Normal Form (3NF)**

**1st Normal Form(1NF)**:The first step of normalization is to convert a table to 1NF. This means that every field of a table will contain single values only, and every table will have a primary key.

Consider this table:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Customer ID** | **Customer Name** | **Car Number Plate** | **Car Name** | **Date of Transaction** | **Owner ID** | **Owner Name** |
| C12 | Sachin | CarQ1234 | Swift | 12/01/2020 | O76 | Dev |
| C12 | Sachin | CarQ5436 | Thar | 18/01/2020 | O54 | Rohit |
| C46 | Rahul | CarQ3421 | Baleno | 12/01/2020 | O54 | Rohit |
| C46 | Rahul | CarQ6534 | Honda City | 14/01/2020 | O65 | Shikhar |
| C46 | Rahul | CarQ3789 | Swift | 15/01/2020 | O86 | Irfan |

We have already separated multiple values into different rows. Each row in this table contains a unique transaction. To identify each row, we must find a primary key for this table.

**Single attribute keys:**

* Customer ID: One customer can rent many cars.
* Car Number Plate: One car can be rented multiple times.
* Date of Transaction: Many transactions can occur in one day.

**Multiple attribute keys:**

* Customer ID and Car Number Plate: One customer can rent many cars.
* Customer ID and Date of Transaction: One customer can rent two cars on the same day.
* Car Number Plate and Date of Transaction: One car can be rented only once a day.

Car Number Plate and Date of Transaction are unique for each row. They together form the composite key for this table.