

# DATABASE - FIRST NORMAL FORM 1NF

<http://www.tutorialspoint.com/sql/first-normal-form.htm>

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First normal form 1NF sets the very basic rules for an organized database:

- Define the data items required, because they become the columns in a table. Place related data items in a table.
- Ensure that there are no repeating groups of data.
- Ensure that there is a primary key.

## First Rule of 1NF:

You must define the data items. This means looking at the data to be stored, organizing the data into columns, defining what type of data each column contains, and finally putting related columns into their own table.

For example, you put all the columns relating to locations of meetings in the Location table, those relating to members in the MemberDetails table, and so on.

## Second Rule of 1NF:

The next step is ensuring that there are no repeating groups of data. Consider we have the following table:

```
CREATE TABLE CUSTOMERS(  
  ID      INT           NOT NULL,  
  NAME    VARCHAR (20)   NOT NULL,  
  AGE     INT           NOT NULL,  
  ADDRESS CHAR (25),  
  ORDERS  VARCHAR(155)  
);
```

So if we populate this table for a single customer having multiple orders, then it would be something as follows:

ID	NAME	AGE	ADDRESS	ORDERS
100	Sachin	36	Lower West Side	Cannon XL-200
100	Sachin	36	Lower West Side	Battery XL-200
100	Sachin	36	Lower West Side	Tripod Large

But as per 1NF, we need to ensure that there are no repeating groups of data. So let us break above table into two parts and join them using a key as follows:

CUSTOMERS table:

```
CREATE TABLE CUSTOMERS(  
  ID      INT           NOT NULL,  
  NAME    VARCHAR (20)   NOT NULL,  
  AGE     INT           NOT NULL,  
  ADDRESS CHAR (25),  
  PRIMARY KEY (ID)  
);
```

This table would have the following record:

ID	NAME	AGE	ADDRESS
100	Sachin	36	Lower West Side

ORDERS table:

```
CREATE TABLE ORDERS(
  ID INT NOT NULL,
  CUSTOMER_ID INT NOT NULL,
  ORDERS VARCHAR(155),
  PRIMARY KEY (ID)
);
```

This table would have the following records:

ID	CUSTOMER_ID	ORDERS
10	100	Cannon XL-200
11	100	Battery XL-200
12	100	Tripod Large

### Third Rule of 1NF:

The final rule of the first normal form, create a primary key for each table which we have already created

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