

ACID

Atomicity Consistency Isolation and Durability

Atomicity -> Means all the multiple tasks will be completed if there are no issues or everything will fail
 -> Basically atomicity says the transaction is either completed successfully or not at all completed

Consistency -> means it will maintain the consistency and leave it as solid state by complying to all the rules according to the database-

-> In simple rules only valid data will be saved

Isolation -> Means none of the parallel transactions are disturbed

-> In simple words the transaction won't affect the other transactions

Durability means all the data will be saved in the database if there is any system failure or any loss in the transaction

In simple words, the data that is written will not be lost

SQL Transactions

-> Transaction is a unit of work that is performed against the database.

-> They are unit of work that are accomplished in a uniform order

-> The transaction is the propagation of one or more changes made into the database

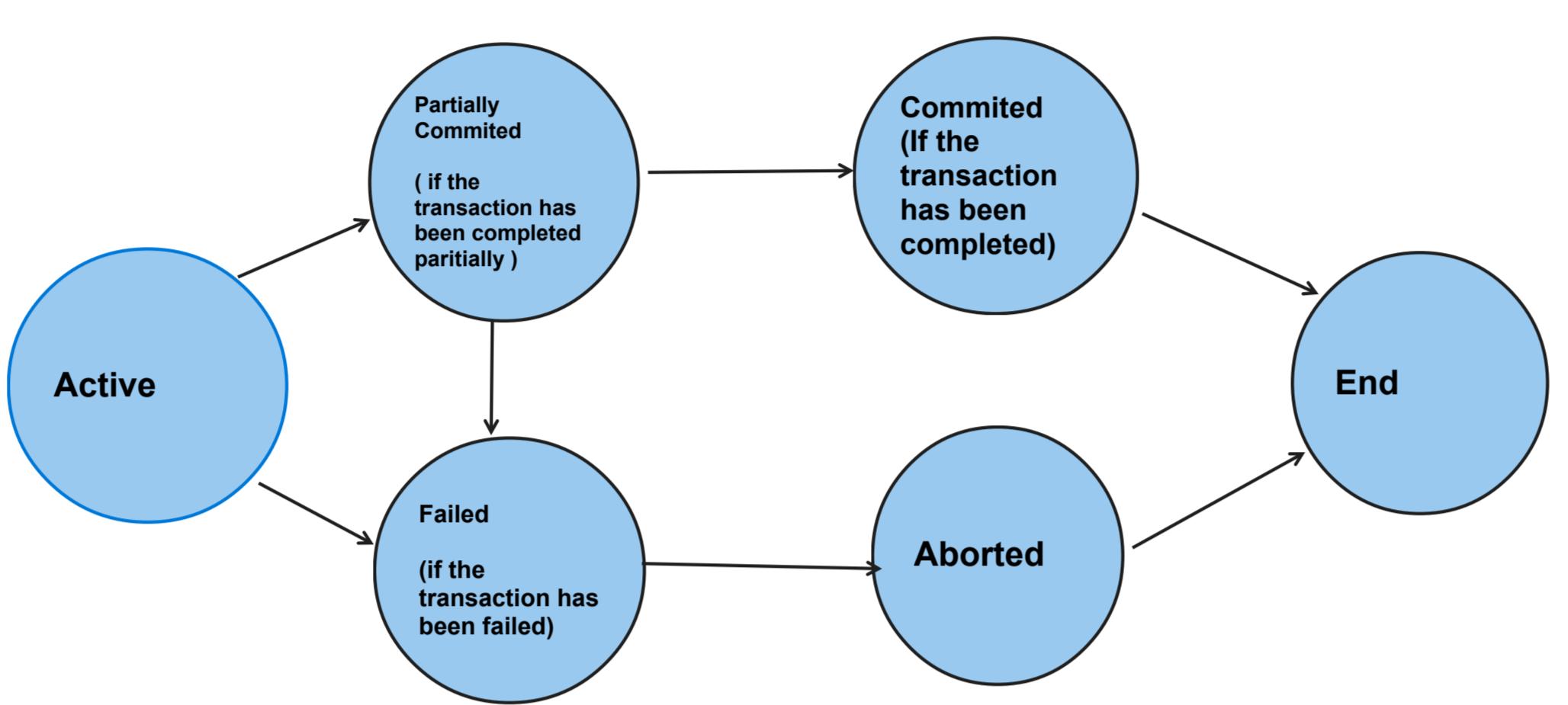
-> Basically a transaction is a sequence of work that has a multiple related tasks that should succeed or fail as one atomic unit

Commit -> all the transaction have been completed and ready to be transferred to the database as the final data

RollBack -> this is the transactional command used to undo transaction that has not been saved into the database

Savepoint - A savepoint is a point in the transaction back to a certain point without rolling back the entire transactions

SQL Transaction State



What is database normalization?
 It is a technique of organizing data in the database, removing duplicate data from the tables and removing complex tasks

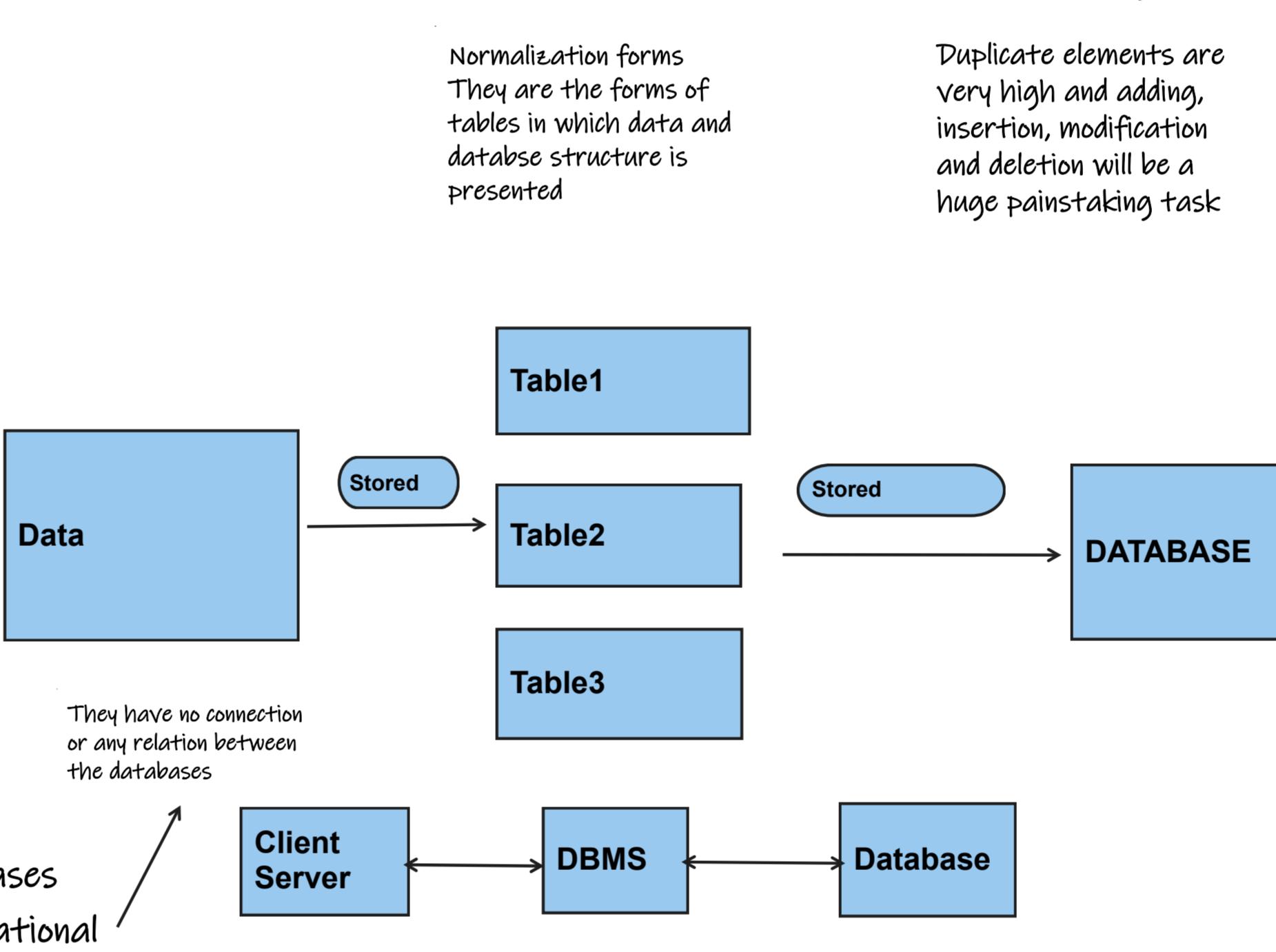
Normalization is used for mainly two purposes
 1. Maintaining the data
 2. All the relations makes sense

What are 1NF?
 1 normal form means each column value may or may not be unique and the data that is mapped is also unique
 In short, every column has an atomic single value

Cons of not using NF1

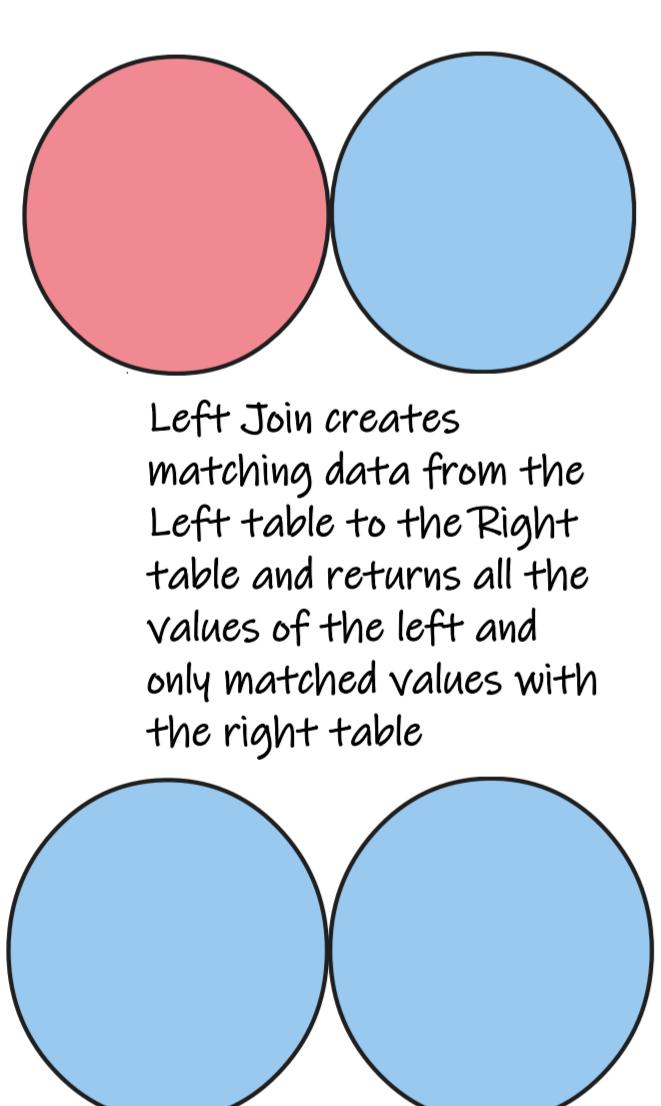
What is 2NF?
 It must follow the rules of first normal form
 Each set of related data should be kept at different tables
 Mainly plays in the role of space and memory efficiency
 If the table has two different and distinct values but added into the same table, then combinations of data will be formed and therefore huge amount of space and memory will be accessed. In order to eliminate such things, we create a second database linking the data from first database to the second using unique elements

What is 3NF?
 It must follow all the rules of the first normal form.
 The table shouldn't contain columns that are not fully dependent on the primary key, which means each row is single

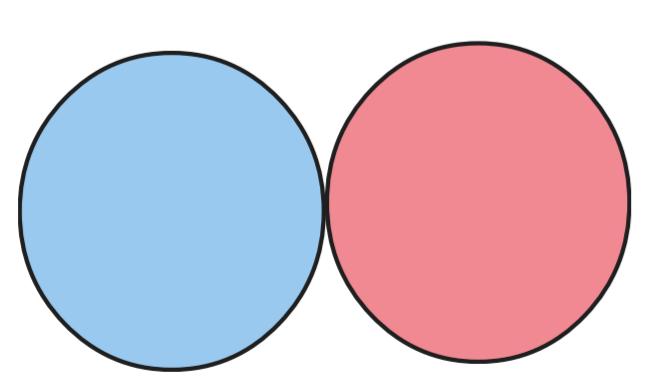


Cons of not using NF2
 Duplicate elements are very high and adding, Repetition of large datasets is a huge loss and data storage and memory storage is also very high

Retrieving of the data due to repetitiveness is also very high and very complicated



The INNER JOIN creates a new table by combining the values of two different tables holding a single common value



Right Join creates matching data from the Right table to the Left table and returns all the values of the Right and only matched values from the Left table

Basic Operations in a database

Create
 Alter
 Drop

Basic Operations in a database

Create Table
 Alter Table
 Drop Table

Date/Time Function

There are special types of functions that include

GETDATE() - Will return the date in the current operating system, That is the date and time when the current query was executed

ISDATE() - checks whether the parameter is a valid date, if it is then it will return 1 or else return 0

DAY() -> returns the day of the week derived from current day

MONTH() -> returns the month from the GETDATE string,

YEAR() -> returns a year value

DATENAME() -> returns the value of the part that is specified in the string

DATETIME() -> returns the name of the date in a string format

DATEADD() -> will return the value that is assigned to the second argument and returns the actual date after being added value

Creation of a database

This process can be created
 - Graphically
 - Using Query
 Working with tables

Data is stored in tables and the tables mainly comprise of rows and columns

CREATE TABLE
 ALTER TABLE
 DROP TABLE

String Functions

LEN() -> returns the length of the string

LEFT(string,value) -> returns the elements from the left of the string based on the integer value given

TRIM() -> removes the leading and trailing elements in a string

UPPER() and LOWER() -> Converts the string from lower case to upper case and vice versa

REVERSE() -> reverses the string in the given query

REPLACE(string,oldstring,newstring) -> replaces the current substring with a given substring

SUBSTRING(string,start,length)

Change the name of the database

This process can be executed
 - Graphically
 - Using Query

There are certain datatypes related to tables

Int - Integer
 Varchar - String
 Bit - character
 Decimal - Float
 DateTime - shows data and time

Binary - D and 1

Drop or Delete

This process can be executed
 - Graphically
 - Using Query

There are certain types of constraints that can be added to the tables

Not null - which means basically it ensures the data that is going in is or cannot be NULL

DEFAULT - which means the default value is given if none of the values are not defined

PRIMARY KEY - it is a type of key which uniquely defines each record

If you want to connect or relate from one database to another using foreign key you have to reference the primary key of first table

Note while insertion of data, you have to give the values to the table has the primary key data and not the reference data

If the dept id is accepted to insertion or reference ID then the value will be accepted

Foreign Key

Basically a primary key is a column or a set of column of tables which matches with one set of values in one table to other set of values in the other table

The primary key from one table is related to the other table therefore becoming a foreign key

This is used to match the foreign key of first table and foreign key of second table

If the dept id is accepted to insertion or reference ID then the value will be accepted

Unique

Unique Constraint prevents duplication or addition of two elements to the same column or addition of same number to a single column

SQL operators

There are 6 types of SQL operators
 1. = -> Equals to
 2. >= Greater than or equal to
 3. <= Lesser than or equal to
 4. <> Not equal to

Logical Operators

1. AND - both the condition on left and right operands are true
 2. OR - either one of the conditions on left and right must be true
 3. BETWEEN - the values must be in between the initial and final range
 4. EXISTS - if the value is not NULL or if the query returns records
 5. IN - if it is equal one in a pool of thousand values or expressions