Introduction to SQL

What is SQL?

SQL stands for Structured Query Language. It is used for accessing and manipulating the data.

SQL uses CRUD operations to communicate with the databases. CRUD stands for Create, Read, Update and Delete procedures.

Here is a breakdown of CRUD operations -

- CREATE procedures: Performs the INSERT statement to create a new record.
- READ procedures: Reads the records of the table
- UPDATE procedures: Executes an UPDATE statement on the table based on the specified primary key for a record within the WHERE clause of the statement.
- DELETE procedures: Deletes a specified row in the WHERE clause.

What is RDBMS?

RDBMS stands for **Relational Database Management System**. It is the basis for SQL, and for all modern database systems Ex- MS SQL, MySQL, etc.

Tables are the database objects that are used in RDBMS. Table is a collection of related data entries and it consists of numerous columns and rows.

Table is the simplest form of data storage in a Relational Database. Below is an example of table named Ninjas which contains attributes ID, Ninja's Name and City-

ID	Ninja's Name	City
101	Lokesh Ninja	Kolkata
102	Kuldeep Ninja	Bhopal
103	Ojasv Ninja	Shimla

In this course we will be using an open-source RDBMS i.e MySQL. This database uses Structured Query Language for all CRUD operations and other procedures.

MySQL uses the Client-Server model. In this model a "client" is a front-end application that uses the services provided by a MySQL server. And this whole use of the services takes place through SQL Queries.

Difference between MySQL and SQL :

SQL	MySQL
SQL is a Structured Query Language. It is useful to manage relational databases.	MySQL is an RDBMS to store, retrieve, modify and administrate a database using SQL.
SQL is a query **language**.	MYSQL is used as an **RDBMS** database.
To query and operate database systems.	Allows data handling, storing, modifying, deleting in a tabular format.

Example: Banking System -

Understanding basic MySQL database using Banking System with help of ER Model.

Note:- ER Model :

1. Entity - Real world object (Can be understand as a tables)
2. Attributes - These are the properties of the entity.

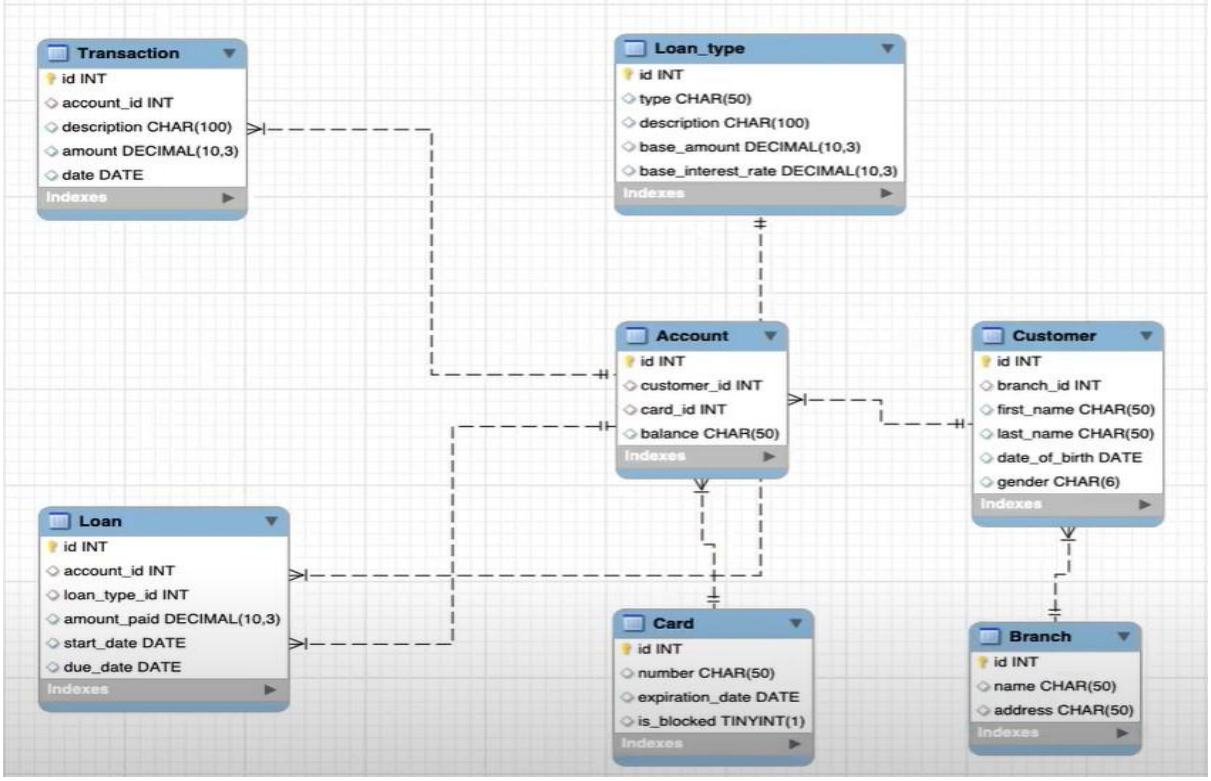
In our Banking system we will be considering below mentioned entities:

1. Customer
2. Account
3. Branches
4. Loan
5. Loan type(Loan_type)
6. Transactions
7. Cards

Customer entity and with attributes(column):-

customer_id	branch_id	first_name	last_name	Gender	D.O.B

In this above customer entity we have used branch_id as the attribute that we can use to set up a relationship with Branch entity. Similarly, in the given ER Model below we can understand the different relationships that exist between different entities.


Transaction
id INT
account_id INT
description CHAR(100)
amount DECIMAL(10,3)
date DATE
Indexes
Loan_type
id INT
type CHAR(50)
description CHAR(100)
base_amount DECIMAL(10,3)
base_interest_rate DECIMAL(10,3)
Indexes
Account
id INT
customer_id INT
card_id INT
balance CHAR(50)
Indexes
Customer
id INT
branch_id INT
first_name CHAR(50)
last_name CHAR(50)
date_of_birth DATE
gender CHAR(6)
Indexes
Loan
id INT
account_id INT
loan_type_id INT
amount_paid DECIMAL(10,3)
start_date DATE
due_date DATE
Indexes
Card
id INT
number CHAR(50)
expiration_date DATE
is_blocked TINYINT(1)
Indexes
Branch
id INT
name CHAR(50)
address CHAR(50)
Indexes