

Explanation of Set theory using Sql database

→ Database are the Collection of data and information that are typically stored in a Computer System.

DBMS:- Database management System

Software are the Software that is used to Create and manage Databases.

Eg:- Sql, Oracle, mongoDB, etc.

Sql:- Structured Query language (SQL) is a standard -based programming language used to manage and manipulate relational Database. It is used to perform various operations on data stored in RDBMS (Relational database management system). It is propounded by Donald D. Chamberlin and Raymond F. Boyce at IBM in early 1970s.

example of Relational Database.

~~Set theory~~ Table name of Student

Stu_ID	Stu_Name	Stu_major	Year
1	Alice	Computer_Sic	2023
2	Bob	Mathematic Mathematic	2024
3	Charlie	English	2023
4	Raina	Computer_Sic	2024

Example Table to Show all Set Operation

Table 1: Employees

Emp_ID	Name	Department
1	Alice	HR
2	Bob	IT
3	Charlie	Finance
4	Raina	IT

Table 2: Departments

Department ID	Department
1	HR
2	IT
3	Marketing
4	Finance

Set Operation in SQL

Union (U)

→ In SQL, This Define as Combination of two or more Select Queries and removing duplicate.

SQL Syntax

```
SELECT column-name  
FROM table1;
```

```
UNION  
SELECT column-name FROM table2;
```

Example

SQL

```
SELECT Department FROM Employees
```

UNION

```
SELECT Department FROM Departments;
```

Result

Department
HR
IT
Finance
Marketing

Marketing
R&D
IT
Finance
HR

② Union All (UNION ALL)

Combines the results of two queries, including duplicates

Example SQL Syntax

SQL:

```
SELECT Column_name FROM table1  
UNION ALL
```

```
SELECT Column_name FROM table2;
```

Example

```
SELECT Department FROM Employees  
UNION ALL
```

```
SELECT Department FROM Departments;
```

Result

Department
HR
IT
Finance
IT
HR
IT
Marketing
Finance

Department
IT
HR
Marketing

3) Intersection (Inner Join) SQL

→ Return Only those rows which are present in both queries

Syntax

DISTINCT
Select 1 Column
From table1

INNER JOIN table2

On table1.Column_name = table2.Column_name;

Dist

In can return duplicate
So we use Distinct
Distinct -> ensure
no duplication

See example

Distinct
Select Employee.Department
From Employee

Innerjoin Departments on Employee.Department
= Departments.Department ;

Result

Without Distinct

Department
HR
IT
IT
Finance

With Distinct

Department
HR
IT
FINANCE

④ Difference (Left Join)

→ It return rows from the first 2nd Query
that are not present in 2nd first Query

Syntax

Table2.
SELECT ~~Column1 name~~ Column2 name
From Table2 name.

(To show difference in
2nd -table)

Left join Table3 on Table2. ^{Column2} = Table3. ^{Column1}
where Table3. ^{Column1} Is Null;

Or,

To show difference in First table

Table3.
Select Column2
from Table1.name name

Left join Table2 name On Table1.name. Column1
= Table2.name. Column2

Where Table1.Column1 Is Null;

Example Query

SELECT Departments. Department
From Departments

Left join ~~Employee~~

On Departments. Department = Employee. Department
Where Employee. Department Is Null;

Result

