Experiment No:3

Aim:

SQL Relational ,Logical and Arithmetic operators, UNION, INTERSECTION and MINUS operators.

Theory:

Relational Operators:

Relational operators compare two expressions or values and return a Boolean result.

Operator	Description
=	Checks if the values of two operands are equal or not, if yes then condition becomes true.
!= , < > , ~=	Checks if the values of two operands are equal or not, if values are not equal then condition becomes true..
>	Checks if the value of left operand is greater than the value of right operand, if yes then condition becomes true.
<	Checks if the value of left operand is less than the value of right operand, if yes then condition becomes true.
>=	Checks if the value of left operand is greater than or equal to the value of right operand, if yes then condition becomes true.
<=	Checks if the value of left operand is less than or equal to the value of right operand, if yes then condition becomes true.

Logical Operators:

These are the operators used logical representation of some condition in a query.Logical operators test for the truth of some condition. Logical operators return a **Boolean** data type with a value of TRUE, FALSE, or UNKNOWN.

Operator	Description
ALL	The ALL operator is used to compare a value to all values in another value set.
AND	The AND operator allows the existence of multiple conditions in an SQL statement's WHERE clause.
ANY	The ANY operator is used to compare a value to any applicable value in the list according to the condition.
BETWEEN	The BETWEEN operator is used to search for values that are within a set of values, given the minimum value and the maximum value.
EXISTS	The EXISTS operator is used to search for the presence of a row in a specified table that meets certain criteria.

IN	The IN operator is used to compare a value to a list of literal values that have been specified.
LIKE	The LIKE operator is used to compare a value to similar values using wildcard operators.
NOT	The NOT operator reverses the meaning of the logical operator with which it is used. E.g.: NOT EXISTS, NOT BETWEEN, NOT IN, etc. **This is a negate operator.**
OR	The OR operator is used to combine multiple conditions in an SQL statement's WHERE clause.
IS NULL	The NULL operator is used to compare a value with a NULL value.
UNIQUE	The UNIQUE operator searches every row of a specified table for uniqueness (no duplicates).

Arithmetic operators:

Arithmetic operators perform mathematical operations on two expressions of one or more of the data types of the numeric data type category.

Operator	Description
+	Addition - Adds values on either side of the operator
-	Subtraction - Subtracts right hand operand from left hand operand
*	Multiplication - Multiplies values on either side of the operator
/	Division - Divides left hand operand by right hand operand
%	Modulus - Divides left hand operand by right hand operand and returns remainder

Set Operators:

Set operators are used to join the results of two (or more) SELECT statements. The SET operators available in Oracle 11g are UNION, UNION ALL, INTERSECT, and MINUS.

The UNION set operator returns the combined results of the two SELECT statements. Essentially, it removes duplicates from the results i.e. only one row will be listed for each duplicated result. To counter this behavior,use the UNION ALL set operator which retains the duplicates in the final result.INTERSECT lists only records that are common to both the SELECT queries; the MINUS set operator removes the second query's results from the output if they are also found in the first query's results. INTERSECT and MINUS set operations produce unduplicated results.

All the SET operators share the same degree of precedence among them.Instead,during query execution, Oracle starts evaluation from left to right or from top to bottom.If explicitly parentheses are used, then the order may differ as parentheses would be given priority over dangling operators.

Union:

Combines the results of two or more queries into a single result set that includes all the rows that belong to all queries in the union. The UNION operation is different from using joins that combine columns from two tables.

The following are basic rules for combining the result sets of two queries by using UNION:

- The number and the order of the columns must be the same in all queries.
- The data types must be compatible.

SQL UNION Syntax

```
SELECT column_name(s) FROM table1
UNION
SELECT column_name(s) FROM table2;
```

Intersect:

The SQL **INTERSECT** clause/operator is used to combine two SELECT statements, but returns rows only from the first SELECT statement that are identical to a row in the second SELECT statement. This means INTERSECT returns only common rows returned by the two SELECT statements.

Syntax:

The basic syntax of **INTERSECT** is as follows:

```
SELECT column1 [, column2 ]
FROM table1 [, table2 ]
[WHERE condition]
INTERSECT
SELECT column1 [, column2 ]
FROM table1 [, table2 ]
[WHERE condition]
```

Minus /Except :

The SQL **EXCEPT** clause/operator is used to combine two SELECT statements and returns rows from the first SELECT statement that are not returned by the second SELECT statement. This means EXCEPT returns only rows, which are not available in second SELECT statement.

The basic rules for combining the result sets of two queries that use EXCEPT or INTERSECT are the following:

- The number and the order of the columns must be the same in all queries.
- The data types must be compatible.

Syntax:

The basic syntax of **EXCEPT** is as follows:

```
SELECT column1 [, column2 ]
  FROM table1 [, table2 ]
     [WHERE condition]
          EXCEPT
SELECT column1 [, column2 ]
  FROM table1 [, table2 ]
     [WHERE condition]
```

Code:

```
t151070031@t151070031-VirtualBox:~$ mysql -u root -p
Enter password:
Welcome to the MySQL monitor.  Commands end with ; or \g.
Your MySQL connection id is 6
Server version: 5.7.17-0ubuntu0.16.04.1 (Ubuntu)

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owners.

Type 'help;' or '\h' for help. Type '\c' to clear the current input
statement.

mysql> show databases;
+--------------------+
| Database           |
+--------------------+
| information_schema |
| exp2               |
| mysql              |
| performance_schema |
| sys                |
+--------------------+
5 rows in set (0.50 sec)

mysql> use exp2;
Reading table information for completion of table and column names
You can turn off this feature to get a quicker startup with -A

Database changed
mysql> show tables;
+----------------+
| Tables_in_exp2 |
+----------------+
| Orders         |
| employee       |
+----------------+
2 rows in set (0.00 sec)
```

```
mysql> select * from employee;
+------+--------+---------+------+-------------+
| SSN  | Name   | college | age  | salary_in_$ |
+------+--------+---------+------+-------------+
| 1200 | Patrik | IITB    |   20 |    10000.00 |
| 1201 | Tushar | V.J.T.I |   20 |     9000.00 |
| 1202 | Viral  | V.J.T.I |   20 |     8000.00 |
| 1203 | Agam   | V.J.T.I |   20 |     7000.00 |
| 1204 | Vatsal | V.J.T.I |   20 |     6000.00 |
| 1206 | Jainam | V.J.T.I |   20 |     7012.00 |
| 1206 | Jainam | V.J.T.I |   21 |     7012.00 |
+------+--------+---------+------+-------------+
7 rows in set (1.35 sec)

mysql> update employee set salary_in_$=salary_in_$*0.99;
Query OK, 7 rows affected (3.99 sec)
Rows matched: 7  Changed: 7  Warnings: 0

mysql> select * from employee;
+------+--------+---------+------+-------------+
| SSN  | Name   | college | age  | salary_in_$ |
+------+--------+---------+------+-------------+
| 1200 | Patrik | IITB    |   20 |     9900.00 |
| 1201 | Tushar | V.J.T.I |   20 |     8910.00 |
| 1202 | Viral  | V.J.T.I |   20 |     7920.00 |
| 1203 | Agam   | V.J.T.I |   20 |     6930.00 |
| 1204 | Vatsal | V.J.T.I |   20 |     5940.00 |
| 1206 | Jainam | V.J.T.I |   20 |     6941.88 |
| 1206 | Jainam | V.J.T.I |   21 |     6941.88 |
+------+--------+---------+------+-------------+
7 rows in set (0.00 sec)

mysql> update employee set salary_in_$=salary_in_$*1.02;
Query OK, 7 rows affected, 2 warnings (0.25 sec)
Rows matched: 7  Changed: 7  Warnings: 2

mysql> select * from employee;
+------+--------+---------+------+-------------+
| SSN  | Name   | college | age  | salary_in_$ |
+------+--------+---------+------+-------------+
| 1200 | Patrik | IITB    |   20 |    10098.00 |
| 1201 | Tushar | V.J.T.I |   20 |     9088.20 |
| 1202 | Viral  | V.J.T.I |   20 |     8078.40 |
| 1203 | Agam   | V.J.T.I |   20 |     7068.60 |
| 1204 | Vatsal | V.J.T.I |   20 |     6058.80 |
| 1206 | Jainam | V.J.T.I |   20 |     7080.72 |
| 1206 | Jainam | V.J.T.I |   21 |     7080.72 |
+------+--------+---------+------+-------------+
7 rows in set (0.00 sec)

mysql> alter table employee add column sr_no int;
Query OK, 0 rows affected (10.49 sec)
Records: 0  Duplicates: 0  Warnings: 0

mysql> select * from employee;
```

```
+------+--------+---------+------+-------------+-------+
| SSN  | Name   | college | age  | salary_in_$ | sr_no |
+------+--------+---------+------+-------------+-------+
| 1200 | Patrik | IITB    |   20 |    10098.00 |  NULL |
| 1201 | Tushar | V.J.T.I |   20 |     9088.20 |  NULL |
| 1202 | Viral  | V.J.T.I |   20 |     8078.40 |  NULL |
| 1203 | Agam   | V.J.T.I |   20 |     7068.60 |  NULL |
| 1204 | Vatsal | V.J.T.I |   20 |     6058.80 |  NULL |
| 1206 | Jainam | V.J.T.I |   20 |     7080.72 |  NULL |
| 1206 | Jainam | V.J.T.I |   21 |     7080.72 |  NULL |
+------+--------+---------+------+-------------+-------+
7 rows in set (0.00 sec)

mysql> update employee set sr_no=SSN-1200;
Query OK, 7 rows affected (1.61 sec)
Rows matched: 7  Changed: 7  Warnings: 0

mysql> select * from employee;
+------+--------+---------+------+-------------+-------+
| SSN  | Name   | college | age  | salary_in_$ | sr_no |
+------+--------+---------+------+-------------+-------+
| 1200 | Patrik | IITB    |   20 |    10098.00 |     0 |
| 1201 | Tushar | V.J.T.I |   20 |     9088.20 |     1 |
| 1202 | Viral  | V.J.T.I |   20 |     8078.40 |     2 |
| 1203 | Agam   | V.J.T.I |   20 |     7068.60 |     3 |
| 1204 | Vatsal | V.J.T.I |   20 |     6058.80 |     4 |
| 1206 | Jainam | V.J.T.I |   20 |     7080.72 |     6 |
| 1206 | Jainam | V.J.T.I |   21 |     7080.72 |     6 |
+------+--------+---------+------+-------------+-------+
7 rows in set (0.00 sec)

mysql> delete from employee where age=20;
Query OK, 6 rows affected (0.73 sec)

mysql> select * from employee;
+------+--------+---------+------+-------------+-------+
| SSN  | Name   | college | age  | salary_in_$ | sr_no |
+------+--------+---------+------+-------------+-------+
| 1206 | Jainam | V.J.T.I |   21 |     7080.72 |     6 |
+------+--------+---------+------+-------------+-------+
1 row in set (0.00 sec)

mysql> insert into
employee(SSN,Name,college,age,salary_in_$)values(1200,"Patrik","IITB
",20,10000),(1201,"Tushar","V.J.T.I",20,9000);
Query OK, 2 rows affected (0.18 sec)
Records: 2  Duplicates: 0  Warnings: 0

mysql> select * from employee;
+------+--------+---------+------+-------------+-------+
| SSN  | Name   | college | age  | salary_in_$ | sr_no |
+------+--------+---------+------+-------------+-------+
| 1206 | Jainam | V.J.T.I |   21 |     7080.72 |     6 |
| 1200 | Patrik | IITB    |   20 |    10000.00 |  NULL |
| 1201 | Tushar | V.J.T.I |   20 |     9000.00 |  NULL |
+------+--------+---------+------+-------------+-------+
```

```
3 rows in set (0.00 sec)

mysql> insert into
employee(SSN,Name,age,salary_in_$)values(1202,"Viral",20,8000),(1203
,"Agam",20,7000),(1204,"Vatsal",20,6000);
Query OK, 3 rows affected (0.08 sec)
Records: 3  Duplicates: 0  Warnings: 0

mysql> select * from employee;
+------+--------+---------+------+-------------+-------+
| SSN  | Name   | college | age  | salary_in_$ | sr_no |
+------+--------+---------+------+-------------+-------+
| 1206 | Jainam | V.J.T.I |   21 |     7080.72 |     6 |
| 1200 | Patrik | IITB    |   20 |    10000.00 |  NULL |
| 1201 | Tushar | V.J.T.I |   20 |     9000.00 |  NULL |
| 1202 | Viral  | V.J.T.I |   20 |     8000.00 |  NULL |
| 1203 | Agam   | V.J.T.I |   20 |     7000.00 |  NULL |
| 1204 | Vatsal | V.J.T.I |   20 |     6000.00 |  NULL |
+------+--------+---------+------+-------------+-------+
6 rows in set (0.01 sec)

mysql> alter table employee modify column SSN int primary key;
Query OK, 0 rows affected (0.62 sec)
Records: 0  Duplicates: 0  Warnings: 0

mysql> select * from employee;
+------+--------+---------+------+-------------+-------+
| SSN  | Name   | college | age  | salary_in_$ | sr_no |
+------+--------+---------+------+-------------+-------+
| 1200 | Patrik | IITB    |   20 |    10000.00 |  NULL |
| 1201 | Tushar | V.J.T.I |   20 |     9000.00 |  NULL |
| 1202 | Viral  | V.J.T.I |   20 |     8000.00 |  NULL |
| 1203 | Agam   | V.J.T.I |   20 |     7000.00 |  NULL |
| 1204 | Vatsal | V.J.T.I |   20 |     6000.00 |  NULL |
| 1206 | Jainam | V.J.T.I |   21 |     7080.72 |     6 |
+------+--------+---------+------+-------------+-------+
6 rows in set (0.00 sec)

mysql> update employee set sr_no=SSN-1200;
Query OK, 5 rows affected (0.18 sec)
Rows matched: 6  Changed: 5  Warnings: 0

mysql> select * from employee;
+------+--------+---------+------+-------------+-------+
| SSN  | Name   | college | age  | salary_in_$ | sr_no |
+------+--------+---------+------+-------------+-------+
| 1200 | Patrik | IITB    |   20 |    10000.00 |     0 |
| 1201 | Tushar | V.J.T.I |   20 |     9000.00 |     1 |
| 1202 | Viral  | V.J.T.I |   20 |     8000.00 |     2 |
| 1203 | Agam   | V.J.T.I |   20 |     7000.00 |     3 |
| 1204 | Vatsal | V.J.T.I |   20 |     6000.00 |     4 |
| 1206 | Jainam | V.J.T.I |   21 |     7080.72 |     6 |
+------+--------+---------+------+-------------+-------+
6 rows in set (0.00 sec)

mysql>
```

```
t151070031@t151070031-VirtualBox:~$ mysql -u root -p
Enter password:
Welcome to the MySQL monitor.  Commands end with ; or \g.
Your MySQL connection id is 4
Server version: 5.7.17-0ubuntu0.16.04.1 (Ubuntu)

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affiliates. Other names may be trademarks of their respective
owners.

Type 'help;' or '\h' for help. Type '\c' to clear the current input
statement.

mysql> use database exp2
ERROR 1049 (42000): Unknown database 'database'
mysql> use exp2
Reading table information for completion of table and column names
You can turn off this feature to get a quicker startup with -A

Database changed
mysql> show tables;
+----------------+
| Tables_in_exp2 |
+----------------+
| Orders         |
| employee       |
+----------------+
2 rows in set (0.00 sec)

mysql> select * from employee;
+------+--------+---------+------+-------------+-------+
| SSN  | Name   | college | age  | salary_in_$ | sr_no |
+------+--------+---------+------+-------------+-------+
| 1200 | Patrik | IITB    |   20 |    10000.00 |     0 |
| 1201 | Tushar | V.J.T.I |   20 |     9000.00 |     1 |
| 1202 | Viral  | V.J.T.I |   20 |     8000.00 |     2 |
| 1203 | Agam   | V.J.T.I |   20 |     7000.00 |     3 |
| 1204 | Vatsal | V.J.T.I |   20 |     6000.00 |     4 |
| 1206 | Jainam | V.J.T.I |   21 |     7080.72 |     6 |
+------+--------+---------+------+-------------+-------+
6 rows in set (0.54 sec)

mysql> select SSN%10 FROM EMPLOYEE;
ERROR 1146 (42S02): Table 'exp2.EMPLOYEE' doesn't exist
mysql> select SSN%10 FROM employee;
+--------+
| SSN%10 |
+--------+
|      0 |
|      1 |
|      2 |
|      3 |
|      4 |
```

```
|      6 |
+--------+
6 rows in set (0.00 sec)

mysql> select SSN,Name from employee where salary>7000;
ERROR 1054 (42S22): Unknown column 'salary' in 'where clause'
mysql> select SSN,Name from employee where salary_in_$>7000;
+------+--------+
| SSN  | Name   |
+------+--------+
| 1200 | Patrik |
| 1201 | Tushar |
| 1202 | Viral  |
| 1206 | Jainam |
+------+--------+
4 rows in set (0.05 sec)

mysql> select SSN,Name from employee where salary_in_$>=7000;
+------+--------+
| SSN  | Name   |
+------+--------+
| 1200 | Patrik |
| 1201 | Tushar |
| 1202 | Viral  |
| 1203 | Agam   |
| 1206 | Jainam |
+------+--------+
5 rows in set (0.01 sec)

mysql> select SSN,Name from employee where salary_in_$<=7000;
+------+--------+
| SSN  | Name   |
+------+--------+
| 1203 | Agam   |
| 1204 | Vatsal |
+------+--------+
2 rows in set (0.01 sec)

mysql> select SSN,Name from employee where salary_in_$<7000;
+------+--------+
| SSN  | Name   |
+------+--------+
| 1204 | Vatsal |
+------+--------+
1 row in set (0.00 sec)

mysql> select SSN,Name from employee where salary_in_$=7000;
+------+------+
| SSN  | Name |
+------+------+
| 1203 | Agam |
+------+------+
1 row in set (0.03 sec)

mysql> select SSN,Name from employee where salary_in_$!=7000;
+------+--------+
```

```
| SSN  | Name   |
+------+--------+
| 1200 | Patrik |
| 1201 | Tushar |
| 1202 | Viral  |
| 1204 | Vatsal |
| 1206 | Jainam |
+------+--------+
5 rows in set (0.01 sec)

mysql> select SSN,Name from employee where salary_in_$<>7000;
+------+--------+
| SSN  | Name   |
+------+--------+
| 1200 | Patrik |
| 1201 | Tushar |
| 1202 | Viral  |
| 1204 | Vatsal |
| 1206 | Jainam |
+------+--------+
5 rows in set (0.01 sec)

mysql> select *from employee;
+------+--------+---------+------+-------------+-------+
| SSN  | Name   | college | age  | salary_in_$ | sr_no |
+------+--------+---------+------+-------------+-------+
| 1200 | Patrik | IITB    |   20 |    10000.00 |     0 |
| 1201 | Tushar | V.J.T.I |   20 |     9000.00 |     1 |
| 1202 | Viral  | V.J.T.I |   20 |     8000.00 |     2 |
| 1203 | Agam   | V.J.T.I |   20 |     7000.00 |     3 |
| 1204 | Vatsal | V.J.T.I |   20 |     6000.00 |     4 |
| 1206 | Jainam | V.J.T.I |   21 |     7080.72 |     6 |
+------+--------+---------+------+-------------+-------+
6 rows in set (0.00 sec)

mysql> select * from employee where Name like "V%l"
    -> ;
+------+--------+---------+------+-------------+-------+
| SSN  | Name   | college | age  | salary_in_$ | sr_no |
+------+--------+---------+------+-------------+-------+
| 1202 | Viral  | V.J.T.I |   20 |     8000.00 |     2 |
| 1204 | Vatsal | V.J.T.I |   20 |     6000.00 |     4 |
+------+--------+---------+------+-------------+-------+
2 rows in set (0.04 sec)

mysql> select * from employee where Name like "V%l" and salary_in_$
in (select avg(salary_in_$) as salary from employee);
Empty set (0.05 sec)

mysql> select * from employee where Name like "V%l" and
salary_in_$>(select avg(salary_in_$) as salary from employee);
+------+-------+---------+------+-------------+-------+
| SSN  | Name  | college | age  | salary_in_$ | sr_no |
+------+-------+---------+------+-------------+-------+
| 1202 | Viral | V.J.T.I |   20 |     8000.00 |     2 |
+------+-------+---------+------+-------------+-------+
```

```
1 row in set (0.01 sec)

mysql> select * from employee where Name like "V%l" or
salary_in_$>(select avg(salary_in_$) as salary from employee);
+------+--------+---------+------+-------------+-------+
| SSN  | Name   | college | age  | salary_in_$ | sr_no |
+------+--------+---------+------+-------------+-------+
| 1200 | Patrik | IITB    |   20 |    10000.00 |     0 |
| 1201 | Tushar | V.J.T.I |   20 |     9000.00 |     1 |
| 1202 | Viral  | V.J.T.I |   20 |     8000.00 |     2 |
| 1204 | Vatsal | V.J.T.I |   20 |     6000.00 |     4 |
+------+--------+---------+------+-------------+-------+
4 rows in set (0.00 sec)

mysql> select * from employee where Name like "V%l" xor
salary_in_$>(select avg(salary_in_$) as salary from employee);
+------+--------+---------+------+-------------+-------+
| SSN  | Name   | college | age  | salary_in_$ | sr_no |
+------+--------+---------+------+-------------+-------+
| 1200 | Patrik | IITB    |   20 |    10000.00 |     0 |
| 1201 | Tushar | V.J.T.I |   20 |     9000.00 |     1 |
| 1204 | Vatsal | V.J.T.I |   20 |     6000.00 |     4 |
+------+--------+---------+------+-------------+-------+
3 rows in set (0.01 sec)

mysql> select * from employee where Name in(select Name from
Orders);
+------+--------+---------+------+-------------+-------+
| SSN  | Name   | college | age  | salary_in_$ | sr_no |
+------+--------+---------+------+-------------+-------+
| 1200 | Patrik | IITB    |   20 |    10000.00 |     0 |
| 1201 | Tushar | V.J.T.I |   20 |     9000.00 |     1 |
| 1202 | Viral  | V.J.T.I |   20 |     8000.00 |     2 |
| 1203 | Agam   | V.J.T.I |   20 |     7000.00 |     3 |
| 1204 | Vatsal | V.J.T.I |   20 |     6000.00 |     4 |
+------+--------+---------+------+-------------+-------+
5 rows in set (0.03 sec)

mysql> select * from employee where Name not in(select Name from
Orders);
+------+--------+---------+------+-------------+-------+
| SSN  | Name   | college | age  | salary_in_$ | sr_no |
+------+--------+---------+------+-------------+-------+
| 1206 | Jainam | V.J.T.I |   21 |     7080.72 |     6 |
+------+--------+---------+------+-------------+-------+
1 row in set (0.00 sec)

mysql> select * from employee where sr_no between 1 and 5;
+------+--------+---------+------+-------------+-------+
| SSN  | Name   | college | age  | salary_in_$ | sr_no |
+------+--------+---------+------+-------------+-------+
| 1201 | Tushar | V.J.T.I |   20 |     9000.00 |     1 |
| 1202 | Viral  | V.J.T.I |   20 |     8000.00 |     2 |
| 1203 | Agam   | V.J.T.I |   20 |     7000.00 |     3 |
| 1204 | Vatsal | V.J.T.I |   20 |     6000.00 |     4 |
+------+--------+---------+------+-------------+-------+
```

```
4 rows in set (0.05 sec)

mysql> select * from employee where sr_no between 5 and 1;
Empty set (0.00 sec)

mysql> select * from employee where sr_no between 5 and 5;
Empty set (0.00 sec)

mysql> select * from employee where sr_no between 1 and 6;
+------+--------+---------+------+-------------+-------+
| SSN  | Name   | college | age  | salary_in_$ | sr_no |
+------+--------+---------+------+-------------+-------+
| 1201 | Tushar | V.J.T.I |   20 |     9000.00 |     1 |
| 1202 | Viral  | V.J.T.I |   20 |     8000.00 |     2 |
| 1203 | Agam   | V.J.T.I |   20 |     7000.00 |     3 |
| 1204 | Vatsal | V.J.T.I |   20 |     6000.00 |     4 |
| 1206 | Jainam | V.J.T.I |   21 |     7080.72 |     6 |
+------+--------+---------+------+-------------+-------+
5 rows in set (0.01 sec)

mysql> select * from employee where sr_no between 1 and 1;
+------+--------+---------+------+-------------+-------+
| SSN  | Name   | college | age  | salary_in_$ | sr_no |
+------+--------+---------+------+-------------+-------+
| 1201 | Tushar | V.J.T.I |   20 |     9000.00 |     1 |
+------+--------+---------+------+-------------+-------+
1 row in set (0.00 sec)

mysql> select * from employee where sr_no between 6 and 1;
Empty set (0.01 sec)

mysql> select * from employee where sr_no between 6 and 6;
+------+--------+---------+------+-------------+-------+
| SSN  | Name   | college | age  | salary_in_$ | sr_no |
+------+--------+---------+------+-------------+-------+
| 1206 | Jainam | V.J.T.I |   21 |     7080.72 |     6 |
+------+--------+---------+------+-------------+-------+
1 row in set (0.01 sec)

mysql> select * from Orders;
+------+--------+--------+
| id   | Name   | cost   |
+------+--------+--------+
| 1203 | Agam   | 200.00 |
| 1201 | Tushar |  25.00 |
| 1202 | Viral  | 300.00 |
| 1204 | Vatsal | 500.00 |
| 1201 | Tushar |  30.00 |
| 1200 | Patrik | 200.00 |
| 1201 | Agam   | 201.00 |
| 1203 | Agam   | 200.00 |
| 1201 | Tushar |  25.00 |
| 1202 | Viral  | 300.00 |
| 1204 | Vatsal | 500.00 |
| 1201 | Tushar |  30.00 |
| 1200 | Patrik | 200.00 |
```

```
| 1203 | Agam   | 200.00 |
| 1201 | Tushar |  25.00 |
| 1202 | Viral  | 300.00 |
| 1204 | Vatsal | 500.00 |
| 1201 | Tushar |  30.00 |
| 1200 | Patrik | 200.00 |
| 1203 | Agam   | 200.00 |
| 1201 | Tushar |  25.00 |
| 1202 | Viral  | 300.00 |
| 1204 | Vatsal | 500.00 |
| 1201 | Tushar |  30.00 |
| 1200 | Patrik | 200.00 |
| 1203 | Agam   | 200.00 |
| 1201 | Tushar |  25.00 |
| 1202 | Viral  | 300.00 |
| 1204 | Vatsal | 500.00 |
| 1201 | Tushar |  30.00 |
| 1200 | Patrik | 200.00 |
+------+--------+--------+
31 rows in set (0.00 sec)

mysql> desc Orders;
+-------+--------------+------+-----+---------+-------+
| Field | Type         | Null | Key | Default | Extra |
+-------+--------------+------+-----+---------+-------+
| id    | int(11)      | YES  | MUL | NULL    |       |
| Name  | varchar(100) | YES  |     | NULL    |       |
| cost  | decimal(5,2) | YES  |     | NULL    |       |
+-------+--------------+------+-----+---------+-------+
3 rows in set (0.34 sec)

mysql> create table sublist(id int,Name varchar(50),cost
decimal(5,2)) as (select distinct id,Name,cost from Orders);
Query OK, 7 rows affected (2.10 sec)
Records: 7  Duplicates: 0  Warnings: 0

mysql> select * from sublist;
+------+--------+--------+
| id   | Name   | cost   |
+------+--------+--------+
| 1203 | Agam   | 200.00 |
| 1201 | Tushar |  25.00 |
| 1202 | Viral  | 300.00 |
| 1204 | Vatsal | 500.00 |
| 1201 | Tushar |  30.00 |
| 1200 | Patrik | 200.00 |
| 1201 | Agam   | 201.00 |
+------+--------+--------+
7 rows in set (0.00 sec)
mysql> select SSN as id,Name from employee union select id,Name from
sublist;

+------+--------+
| id   | Name   |
+------+--------+
| 1200 | Patrik |
```

```
| 1201 | Tushar |
| 1202 | Viral  |
| 1203 | Agam   |
| 1204 | Vatsal |
| 1206 | Jainam |
| 1201 | Agam   |
+------+--------+
7 rows in set (0.05 sec)
mysql> select SSN as id,Name from employee union select id,Name from
sublist;
+------+--------+
| id   | Name   |
+------+--------+
| 1200 | Patrik |
| 1201 | Tushar |
| 1202 | Viral  |
| 1203 | Agam   |
| 1204 | Vatsal |
| 1206 | Jainam |
| 1201 | Agam   |
+------+--------+
7 rows in set (0.00 sec)

mysql> select id,Name from sublist where (id,Name) in (select SSN as
id,Name from employee);
+------+--------+
| id   | Name   |
+------+--------+
| 1203 | Agam   |
| 1201 | Tushar |
| 1202 | Viral  |
| 1204 | Vatsal |
| 1201 | Tushar |
| 1200 | Patrik |
+------+--------+
6 rows in set (0.06 sec)

mysql> select id,Name from sublist where (id,Name) not in (select
SSN as id,Name from employee);
+------+------+
| id   | Name |
+------+------+
| 1201 | Agam |
+------+------+
1 row in set (0.03 sec)

mysql> select SSN,employee.Name from employee,Orders where
cost>some(select salary_in_$ from employee) and
employee.SSN=Orders.id;
Empty set (0.06 sec)

mysql> select SSN,employee.Name from employee,Orders where
cost<some(select salary_in_$ from employee) and
employee.SSN=Orders.id;
```

```
+------+--------+
| SSN  | Name   |
+------+--------+
| 1200 | Patrik |
| 1200 | Patrik |
| 1200 | Patrik |
| 1200 | Patrik |
| 1200 | Patrik |
| 1201 | Tushar |
| 1201 | Tushar |
| 1201 | Tushar |
| 1201 | Tushar |
| 1201 | Tushar |
| 1201 | Tushar |
| 1201 | Tushar |
| 1201 | Tushar |
| 1201 | Tushar |
| 1201 | Tushar |
| 1201 | Tushar |
| 1201 | Tushar |
| 1202 | Viral  |
| 1202 | Viral  |
| 1202 | Viral  |
| 1202 | Viral  |
| 1202 | Viral  |
| 1203 | Agam   |
| 1203 | Agam   |
| 1203 | Agam   |
| 1203 | Agam   |
| 1203 | Agam   |
| 1204 | Vatsal |
| 1204 | Vatsal |
| 1204 | Vatsal |
| 1204 | Vatsal |
| 1204 | Vatsal |
+------+--------+
31 rows in set (0.02 sec)

mysql> select SSN,employee.Name,Orders.cost,employee.salary_in_$ as
salary from employee,Orders where cost<some(select salary_in_$ from
employee)
+------+--------+--------+----------+
| SSN  | Name   | cost   | salary   |
+------+--------+--------+----------+
| 1200 | Patrik | 200.00 | 10000.00 |
| 1200 | Patrik | 200.00 | 10000.00 |
| 1200 | Patrik | 200.00 | 10000.00 |
| 1200 | Patrik | 200.00 | 10000.00 |
| 1200 | Patrik | 200.00 | 10000.00 |
| 1201 | Tushar |  25.00 |  9000.00 |
| 1201 | Tushar |  30.00 |  9000.00 |
| 1201 | Tushar | 201.00 |  9000.00 |
| 1201 | Tushar |  25.00 |  9000.00 |
| 1201 | Tushar |  30.00 |  9000.00 |
| 1201 | Tushar |  25.00 |  9000.00 |
| 1201 | Tushar |  30.00 |  9000.00 |
| 1201 | Tushar |  25.00 |  9000.00 |
```

```
| 1201 | Tushar |  30.00 |  9000.00 |
| 1201 | Tushar |  25.00 |  9000.00 |
| 1201 | Tushar |  30.00 |  9000.00 |
| 1202 | Viral  | 300.00 |  8000.00 |
| 1202 | Viral  | 300.00 |  8000.00 |
| 1202 | Viral  | 300.00 |  8000.00 |
| 1202 | Viral  | 300.00 |  8000.00 |
| 1202 | Viral  | 300.00 |  8000.00 |
| 1203 | Agam   | 200.00 |  7000.00 |
| 1203 | Agam   | 200.00 |  7000.00 |
| 1203 | Agam   | 200.00 |  7000.00 |
| 1203 | Agam   | 200.00 |  7000.00 |
| 1203 | Agam   | 200.00 |  7000.00 |
| 1204 | Vatsal | 500.00 |  6000.00 |
| 1204 | Vatsal | 500.00 |  6000.00 |
| 1204 | Vatsal | 500.00 |  6000.00 |
| 1204 | Vatsal | 500.00 |  6000.00 |
| 1204 | Vatsal | 500.00 |  6000.00 |
+------+--------+--------+----------+
31 rows in set (0.01 sec)

mysql> select distinct
SSN,employee.Name,Orders.cost,employee.salary_in_$ as salary from
employee,Orders where cost<some(select salary_in_$ from employee)
and employee.SSN=Orders.id;
+------+--------+--------+----------+
| SSN  | Name   | cost   | salary   |
+------+--------+--------+----------+
| 1200 | Patrik | 200.00 | 10000.00 |
| 1201 | Tushar |  25.00 |  9000.00 |
| 1201 | Tushar |  30.00 |  9000.00 |
| 1201 | Tushar | 201.00 |  9000.00 |
| 1202 | Viral  | 300.00 |  8000.00 |
| 1203 | Agam   | 200.00 |  7000.00 |
| 1204 | Vatsal | 500.00 |  6000.00 |
+------+--------+--------+----------+
7 rows in set (0.03 sec)

mysql> select distinct
SSN,employee.Name,Orders.cost,employee.salary_in_$ as salary from
employee,Orders where cost<all(select salary_in_$ from employee) and
employee.SSN=Orders.id;
+------+--------+--------+----------+
| SSN  | Name   | cost   | salary   |
+------+--------+--------+----------+
| 1200 | Patrik | 200.00 | 10000.00 |
| 1201 | Tushar |  25.00 |  9000.00 |
| 1201 | Tushar |  30.00 |  9000.00 |
| 1201 | Tushar | 201.00 |  9000.00 |
| 1202 | Viral  | 300.00 |  8000.00 |
| 1203 | Agam   | 200.00 |  7000.00 |
| 1204 | Vatsal | 500.00 |  6000.00 |
+------+--------+--------+----------+
7 rows in set (0.16 sec)
```

```
mysql> select if(select avg(salary_in_$) from employee
>7000,Name,cost) from sublist;
ERROR 1064 (42000): You have an error in your SQL syntax; check the
manual that corresponds to your MySQL server version for the right
syntax to use near 'select avg(salary_in_$) from employee
>7000,Name,cost) from sublist' at line 1
mysql> select if((select avg(salary_in_$) from
employee)>7000,Name,cost) from sublist;
+-------------------------------------------------------------+
| if((select avg(salary_in_$) from employee)>7000,Name,cost) |
+-------------------------------------------------------------+
| Agam                                                        |
| Tushar                                                      |
| Viral                                                       |
| Vatsal                                                      |
| Tushar                                                      |
| Patrik                                                      |
| Agam                                                        |
+-------------------------------------------------------------+
7 rows in set (0.02 sec)

mysql> select if((select avg(salary_in_$) from
employee)>7000,Name,cost) as result from sublist;
+--------+
| result |
+--------+
| Agam   |
| Tushar |
| Viral  |
| Vatsal |
| Tushar |
| Patrik |
| Agam   |
+--------+
7 rows in set (0.00 sec)

mysql> select avg(cost) from Orders groupby id;
ERROR 1064 (42000): You have an error in your SQL syntax; check the
manual that corresponds to your MySQL server version for the right
syntax to use near 'id' at line 1
mysql> select id,avg(cost) from Orders groupby id;
ERROR 1064 (42000): You have an error in your SQL syntax; check the
manual that corresponds to your MySQL server version for the right
syntax to use near 'id' at line 1
mysql> select id,avg(cost) from Orders group by id;
+------+------------+
| id   | avg(cost)  |
+------+------------+
| 1200 | 200.000000 |
| 1201 |  43.272727 |
| 1202 | 300.000000 |
| 1203 | 200.000000 |
| 1204 | 500.000000 |
+------+------------+
5 rows in set (0.03 sec)
```

```
mysql> select avg(cost) from Orders group by id;
+------------+
| avg(cost)  |
+------------+
| 200.000000 |
|  43.272727 |
| 300.000000 |
| 200.000000 |
| 500.000000 |
+------------+
5 rows in set (0.01 sec)

mysql> select id,sum(cost) as total_exp from Orders group by id;
+------+-----------+
| id   | total_exp |
+------+-----------+
| 1200 |   1000.00 |
| 1201 |    476.00 |
| 1202 |   1500.00 |
| 1203 |   1000.00 |
| 1204 |   2500.00 |
+------+-----------+
5 rows in set (0.00 sec)

mysql>
```

Conclusion:

Thus, various types of operators supported by SQL were studied in detail and implemented successfully. During implementation, it was discovered that a few operators (like except, etc.) were not supported by MySQL and thus were implemented with their logical counterparts.