Ex. No : 6
Implementation of built-in functions in RDBMS

Construct queries using SQL for database creation, interaction, modification, and updation.

AIM : RDBMS Built in Functions
There are two types of functions:

1) **Single Row Functions:** Single row or Scalar functions return a value for every row
that is processed in a query.
2) **Group Functions:** These functions group the rows of data based on the values returned by the query. This is discussed in SQL GROUP Functions. The group functions are used to calculate aggregate values like total or average, which return just one total or one average value after processing a group of rows.

There are four types of single row functions.
They are:
1) **Numeric Functions:** These are functions that accept numeric input and return numeric values.
2) **Character or Text Functions**: These are functions that accept character input and can return both character and number values.
3) **Date Functions:** These are functions that take values that are of datatype DATE as input and return values of datatype DATE, except for the MONTHS_BETWEEN function, which returns a number.
4) **Conversion Functions**: These are functions that help us to convert a value in one form to another form. For Example: a null value into an actual value, or a value from one datatype to another datatype like NVL, TO_CHAR, TO_NUMBER, TO_DATE etc.

1. Mathematical Functions
    1.1 ABS
    mysql> select ABS(-100) from dual;

```
+-----------+
| ABS(-100) |
+-----------+
|       100 |
+-----------+
```

1.2 FLOOR

```
mysql> select floor(3.14) from dual;
+-------------+
| floor(3.14) |
+-------------+
|           3 |
```

1.3 GREATEST

```
mysql> select greatest (2,3) from dual;
+----------------+
| greatest (2,3) |
+----------------+
|              3 |
+----------------+
```

1.4 LEAST

```
mysql> select least(6,3,6,3,7,1) from dual;
+--------------------+
| least(6,3,6,3,7,1) |
+--------------------+
|                  1 |
+--------------------+
```

1.5 LENGTH

```
mysql> select length('adishankara college') from dual;
+-------------------------------+
| length('adishankara college') |
+-------------------------------+
|                            19 |
+-------------------------------+

mysql> select length (123456) from dual;
+-----------------+
| length (123456) |
+-----------------+
|               6 |
+-----------------+
```

1.6 SQRT

```
mysql> select sqrt(25) from dual;
+----------+
| sqrt(25) |
+----------+
|        5 |
```

1.7 POWER

```
mysql> select power(5,2) from dual;
+------------+
| power(5,2) |
+------------+
|     25     |
+------------+
```

1.8 ROUND

```
mysql> select round(3.5) from dual;
+------------+
| round(3.5) |
+------------+
|      4     |
+------------+
```

```
mysql> select round(3.4) from dual;
+------------+
| round(3.4) |
+------------+
|      3     |
```

1.9 SIN, COS, TAN

```
mysql> select sin(90) from dual;
+--------------------+
| sin(90)            |
+--------------------+
| 0.8939966636005579 |
+--------------------+
```

```
mysql> select cos(90) from dual;
+---------------------+
| cos(90)             |
+---------------------+
| -0.4480736161291701 |
+---------------------+
```

```
mysql> select tan(90) from dual;
+-------------------+
| tan(90)           |
+-------------------+
| -1.995200412208242 |
+-------------------+
```

1.10 LN, LOG

```
mysql> select ln(2) from dual;
+-------------------+
| ln(2)             |
+-------------------+
| 0.6931471805599453 |
+-------------------+
```

```
mysql> select log(2) from dual;
+-------------------+
| log(2)            |
+-------------------+
| 0.6931471805599453 |
+-------------------+
```

1.11 MOD

```
mysql> select mod(4,3) from dual;
+----------+
| mod(4,3) |
+----------+
|        1 |
+----------+
1 row in set (0.00 sec)
```

```
mysql> select mod(4,2) from dual;
+----------+
| mod(4,2) |
+----------+
|        0 |
+----------+
```

1.10 EXP

```
mysql> select exp(2) from dual;
+-----------------+
| exp(2)          |
+-----------------+
```

```
| 7.38905609893065 |
+------------------+

mysql> select exp(-2) from dual;
+-------------------+
| exp(-2)           |
+-------------------+
| 0.1353352832366127 |
+-------------------+

mysql> select exp(0) from dual;
+--------+
| exp(0) |
+--------+
|      1 |
+--------+

mysql> select exp(0) from dual;
+--------+
| exp(0) |
+--------+
|      1 |
+--------+

mysql> select exp(1) from dual;
+------------------+
| exp(1)           |
+------------------+
| 2.718281828459045 |
+------------------+
```

2.Date Functions

```
mysql> SELECT CURRENT_DATE  FROM DUAL;
+--------------+
| CURRENT_DATE |
+--------------+
| 2022-11-21   |
+--------------+

mysql> SELECT EXTRACT(MONTH FROM
CURRENT_DATE ) FROM DUAL;
+------------------------------+
```

```
| EXTRACT(MONTH FROM CURRENT_DATE ) |
+----------------------------------+
|                               11 |
+----------------------------------+

mysql> SELECT EXTRACT(YEAR FROM CURRENT_DATE) FROM DUAL;
+--------------------------------+
| EXTRACT(YEAR FROM CURRENT_DATE) |
+--------------------------------+
|                           2022 |
+--------------------------------+

mysql> SELECT CURRENT_DATE FROM DUAL;
+--------------+
| CURRENT_DATE |
+--------------+
| 2022-11-21   |
+--------------+

mysql> SELECT EXTRACT(YEAR FROM CURRENT_DATE) FROM DUAL;
+--------------------------------+
| EXTRACT(YEAR FROM CURRENT_DATE) |
+--------------------------------+
|                           2022 |
+--------------------------------+
mysql> SELECT EXTRACT(DAY FROM CURRENT_DATE) FROM DUAL;
+-------------------------------+
| EXTRACT(DAY FROM CURRENT_DATE) |
+-------------------------------+
|                            21 |
+-------------------------------+
mysql> SELECT EXTRACT(MONTH FROM CURRENT_DATE) FROM DUAL;
+---------------------------------+
| EXTRACT(MONTH FROM CURRENT_DATE) |
+---------------------------------+
|                               11 |
```

3. String Functions

```
mysql> select ascii('t') from dual;
+-----------+
| ascii('t') |
+-----------+
|       116 |
+-----------+

mysql> select ascii('a') from dual;
+-----------+
| ascii('a') |
+-----------+
|        97 |
+-----------+

mysql> select ascii('A') from dual;
+-----------+
| ascii('A') |
+-----------+
|        65 |

mysql> SELECT lower('ASIET - COLLEGE OF ENGINEERING..')
from dual;
+------------------------------------------+
| lower('ASIET - COLLEGE OF ENGINEERING..') |
+------------------------------------------+
| asiet - college of engineering..         |

mysql> SELECT REPLACE('HELLO','H','K') FROM DUAL;
+------------------------+
| REPLACE('HELLO','H','K') |
+------------------------+
| KELLO                  |
+------------------------+
mysql> SELECT TRIM('A' FROM 'ANACONDA') FROM DUAL;
+------------------------+
| TRIM('A' FROM 'ANACONDA') |
+------------------------+
| NACOND                 |
+------------------------+
```