Shri Vile Parle Kelavani Mandal's
DWARKADAS J. SANGHVI COLLEGE OF ENGINEERING
(Autonomous College Affiliated to the University of Mumbai)
NAAC Accredited with "A" Grade (CGPA : 3.18)

BDI

Name: Kartik Jolapara **Branch:** Computer Engineering

SAP ID: 60004200107 **Batch:** B1

EXPERIMENT NO. 4
HIVE COMMANDS

AIM: Execute HIVE commands to load, insert, retrieve, update, or delete data in the tables.

THEORY:
Hive is a data warehouse infrastructure tool to process structured data in Hadoop. It resides on top of Hadoop to summarize Big Data, and makes querying and analyzing easy.
Initially Hive was developed by Facebook, later the Apache Software Foundation took it up and developed it further as an open source under the name Apache Hive. It is used by different companies. For example, Amazon uses it in Amazon Elastic MapReduce.

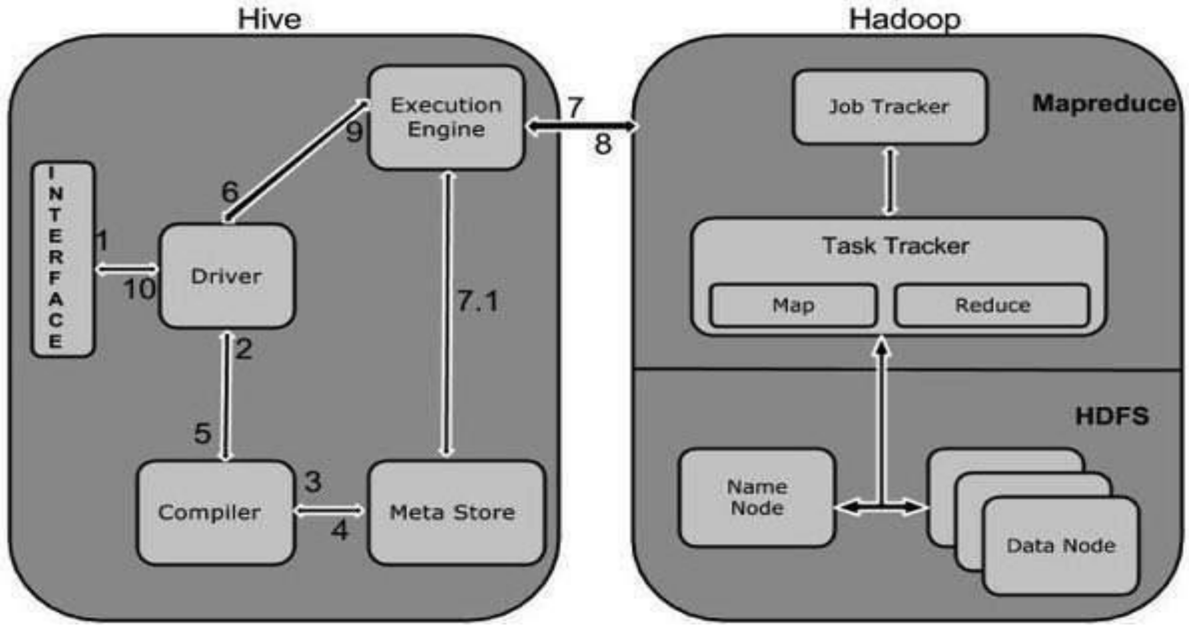
Hive is not
- A relational database
- A design for OnLine Transaction Processing (OLTP)
- A language for real-time queries and row-level updates

Features of Hive

- It stores schema in a database and processed data into HDFS.
- It is designed for OLAP.
- It provides SQL type language for querying called HiveQL or HQL. • It is familiar, fast, scalable, and extensible.

Working of Hive

The following diagram depicts the workflow between Hive and Hadoop.



The following table defines how Hive interacts with Hadoop framework:

1	**Execute Query** The Hive interface such as Command Line or Web UI sends query to Driver (any database driver such as JDBC, ODBC, etc.) to execute.

Step No.	**Operation**

2	**Get Plan** The driver takes the help of query compiler that parses the query to check the syntax and query plan or the requirement of query.
3	**Get Metadata** The compiler sends metadata request to Metastore (any database).
4	**Send Metadata** Metastore sends metadata as a response to the compiler.
5	**Send Plan** The compiler checks the requirement and resends the plan to the driver. Up to here, the parsing and compiling of a query is complete.
6	**Execute Plan** The driver sends the execute plan to the execution engine.
7	**Execute Job** Internally, the process of execution job is a MapReduce job. The execution engine sends the job to JobTracker, which is in Name node and it assigns this job to TaskTracker, which is in Data node. Here, the query executes MapReduce job.
7.1	**Metadata Ops** Meanwhile in execution, the execution engine can execute metadata operations with Metastore.
8	**Fetch Result** The execution engine receives the results from Data nodes.
9	**Send Results** The execution engine sends those resultant values to the driver.
10	**Send Results** The driver sends the results to Hive Interfaces.

CONCLUSION: We have successfully executed HIVE Queries using HQL in Cloudera Framework.

HIVE Query Language

```
http://127.0.0.1:4200   sandbox   login:   root
root@sandbox.hortonworks.com's
password:
Last login: Thu Mar 9 06:30:54 2023 from 172.17.0.2
[root@sandbox ~]# hive

Logging initialized using configuration in file:/etc/hive/2.5.0.0-1245/0/hive-log4j.properties
```

# Show databases already existing in Hive

```
hive> show
databases; OK
bdiexample default
foodmart
retail
xademo
Time taken: 0.025 seconds, Fetched: 5 row(s)
```

# Creating a new database

```
hive> create database studentdb;
```

```
OK
Time taken: 0.072 seconds
```

# Using the database for executing queries

```
hive> use studentdb;
OK
Time taken: 0.042 seconds
```

# Creating a table in Hive

The most used optional clauses in creating a table are:

- IF NOT EXISTS – You can use IF NOT EXISTS to avoid the error in case the table is already present. Hive checks if the requesting table already presents,
- EXTERNAL – Used to create external table
- TEMPORARY – Used to create temporary table.
- ROW FORMAT – Specifies the format of the row.
- FIELDS TERMINATED BY – By default Hive use **^A** field separator, To load a file that has a custom field separator like comma, pipe, tab use this option.
- PARTITION BY – Used to create partition data. Using this improves performance.
- CLUSTERED BY – Dividing the data into a specific number for buckets.
- LOCATION – You can specify the custom location where to store the data on HDFS.
- The *Optimized Row Columnar* (ORC) file format provides a highly efficient way to store Hive data. Using ORC files improves performance when Hive is reading, writing, and processing data. Other file formats supported are : JSON, Text, Sequence, etc.

```
hive> create table student(id int, name varchar(20), branch varchar(20), mobile int)
> PARTITIONED BY (load_date date)
> CLUSTERED BY(id) INTO 3 BUCKETS
> STORED AS ORC TBLPROPERTIES ('transactional'='true');
OK
Time taken: 0.657 seconds
```

#Inserting values in the table

```
hive> insert into student partition (load_date = '2023-03-09') values
(101,'Manav','Computer',123456);
```

```
Query ID = root_20230309064202_db1b9f50-234f-42ed-b028-22d9ba0ff933
Total jobs = 1
Launching Job 1 out of 1

Status: Running (Executing on YARN cluster with App id application_1678329811540_0003)


----------------------------------------------------------------------------------------------
      VERTICES    STATUS TOTAL COMPLETED RUNNING    PENDING FAILED KILLED
----------------------------------------------------------------------------------------------
Map 1 ..........  SUCCEEDED   1       1       0       0       0       0
----------------------------------------------------------------------------------------------
```

```
VERTICES: 01/01 [==========================>>] 100% ELAPSED TIME: 5.54 s

----------------------------------------------------------------------
Loading data to table studentdb.student partition (load_date=2023-03-09)
Partition studentdb.student{load_date=2023-03-09} stats: [numFiles=1, numRows=0, totalSize=858,
rawDataSize=0]
OK
Time taken: 10.075 seconds
```

```
hive> insert into student partition (load_date = '2023-03-09') values (102,'Devraj','Computer',341256
);
```

```
Query   ID   =   root_20230309064238_73e473b3-adc1-4fe9-818c-e077dbed113c
Total jobs = 1
Launching Job 1 out of 1
Status: Running (Executing on YARN cluster with App id application_1678329811540_0003)


----------------------------------------------------------------------
      VERTICES    STATUS TOTAL COMPLETED RUNNING   PENDING FAILED KILLED
----------------------------------------------------------------------
Map 1 ..........  SUCCEEDED    1       1      0      0     0     0
----------------------------------------------------------------------



VERTICES: 01/01 [==========================>>] 100% ELAPSED TIME: 4.71 s

----------------------------------------------------------------------
Loading data to table studentdb.student partition (load_date=2023-03-09)
Partition studentdb.student{load_date=2023-03-09} stats: [numFiles=2, numRows=0,
totalSize=1720, rawD ataSize=0]
OK
Time taken: 5.983 seconds
```

# To display contents of a table

```
hive> select * from student;
OK
101    Manav Computer        123456 2023-03-09
102    Devraj Computer       341256 2023-03-09
Time taken: 0.216 seconds, Fetched: 2 row(s)
```

# Order By Clause (Ordering the result in descending order; by default ascending order)

```
hive> select id, name from student order by id desc;
```

```
Query ID = root_20230309064323_da0caba1-19a2-433e-b579-4505f17dcabc
Total jobs = 1
Launching Job 1 out of 1
Status: Running (Executing on YARN cluster with App id application_1678329811540_0003)
```

```
-----------------------------------------------------------------------
      VERTICES       STATUS TOTAL COMPLETED RUNNING PENDING FAILED KILLED
-----------------------------------------------------------------------

 Map 1 .......... SUCCEEDED      3        3       0       0      0      0
Reducer 2 ........SUCCEEDED      1        1       0       0      0      0
-----------------------------------------------------------------------
VERTICES: 02/02 [==========================>>] 100% ELAPSED TIME: 16.65 s
-----------------------------------------------------------------------

OK
102    Devraj
101    Manav
Time taken: 17.594 seconds, Fetched: 2 row(s)
```

# Inserting a new tuple in the table

```
hive> insert into student partition (load_date = '2023-03-09') values (103,'Sahil','Mechanical',98762
3);
Query ID = root_20230309064439_bfdf6f3d-ce54-4cf6-b31e-65bc23b689e1
Total jobs = 1
Launching Job 1 out of 1
Status: Running (Executing on YARN cluster with App id application_1678329811540_0003)


-----VERTICES-----STATUS TOTAL COMPLETED RUNNING PENDING FAILED KILLED

-----------------------------------------------------------------------
 Map 1 .......... SUCCEEDED      1        1       0       0      0      0
-----------------------------------------------------------------------

VERTICES: 01/01 [==========================>>] 100% ELAPSED TIME: 3.67 s


Loading data to table studentdb.student partition (load_date=2023-03-09)
Partition studentdb.student{load_date=2023-03-09} stats: [numFiles=3, numRows=0, totalSize=2579,
rawD
ataSize=0]
OK
Time taken: 5.262 seconds
```

# Display contents of the table after new entry

```
hive> select * from student;
OK
101    Manav Computer        123456 2023-03-09
102    Devraj Computer       341256 2023-03-09
103    Sahil Mechanical      987623 2023-03-09
Time taken: 0.121 seconds, Fetched: 3 row(s)
```

# Group By Clause (Grouping the result w.r.t branch here)

```
hive> SELECT branch,count(*) FROM student GROUP BY branch;
```

```
Query ID = root_20230309064938_1c36c2cc-682f-4956-bed3-4897f9bd3be4 Total
jobs = 1
Launching Job 1 out of 1

Status: Running (Executing on YARN cluster with App id application_1678329811540_0003)

----------------------------------------------------------------------
      VERTICES       STATUS TOTAL COMPLETED RUNNING PENDING FAILED KILLED
----------------------------------------------------------------------

 Map 1 .......... SUCCEEDED      3        3      0      0     0     0
Reducer 2 ........SUCCEEDED      1        1      0      0     0     0
----------------------------------------------------------------------
VERTICES: 02/02 [==========================>>] 100% ELAPSED TIME: 20.15 s
----------------------------------------------------------------------

OK

Computer       2
Mechanical      1
Time taken: 21.075 seconds, Fetched: 2 row(s)
```

# Update the value in table

Note: update, delete statements will work only if during the creation of table transactional property is set to 'true'.

```
hive> update student set name='Sayli' where id = 103;
Query ID = root_20230309070310_dee26faf-f65d-4c8a-b966-bc18cc118ccc
Total jobs = 1
Launching Job 1 out of 1
Tez session was closed. Reopening...
Session re-established.
Status: Running (Executing on YARN cluster with App id application_1678329811540_0004)


----------------------------------------------------------------------
      VERTICES       STATUS TOTAL COMPLETED RUNNING PENDING FAILED KILLED
----------------------------------------------------------------------

 Map 1 .......... SUCCEEDED      3        3      0      0     0     0
Reducer 2 ........SUCCEEDED      1        1      0      0     0     0
----------------------------------------------------------------------
VERTICES: 02/02 [==========================>>] 100% ELAPSED TIME: 26.39 s
----------------------------------------------------------------------

Loading data to table studentdb.student partition (load_date=null)
        Time taken for load dynamic partitions : 464
       Loading partition {load_date=2023-03-09}
        Time taken for adding to write entity : 5
Partition studentdb.student{load_date=2023-03-09} stats: [numFiles=4, numRows=0, totalSize=3457,
rawDataSize=0]
OK
```

Time taken: 36.217 seconds

```
hive> select * from student;

  OK
  101   Manav Computer         123456 2023-03-09
  102   Devraj Computer        341256 2023-03-09
  103   Sayli Mechanical       987623 2023-03-09
        Time taken: 0.262 seconds, Fetched: 3 row(s)
```

#Delete the entry from the table

```
hive> delete from student where name = 'Sayli';
Query ID = root_20230309070624_382e39b5-755b-41c2-8f04-362939800cbf
Total jobs = 1
Launching Job 1 out of 1

Status: Running (Executing on YARN cluster with App id application_1678329811540_0004)

----------------------------------------------------------------------------
     VERTICES       STATUS TOTAL COMPLETED RUNNING PENDING FAILED KILLED
----------------------------------------------------------------------------


 Map 1 .......... SUCCEEDED      3        3       0       0      0      0
 Reducer 2 ........SUCCEEDED      1        1       0       0      0      0
----------------------------------------------------------------------------
VERTICES: 02/02 [==========================>>] 100% ELAPSED TIME: 19.68 s
----------------------------------------------------------------------------

Loading data to table studentdb.student partition (load_date=null)
        Time taken for load dynamic partitions : 516
       Loading partition {load_date=2023-03-09}
        Time taken for adding to write entity : 0
Partition studentdb.student{load_date=2023-03-09} stats: [numFiles=5, numRows=0, totalSize=3990,
rawDataSize=0]
OK
Time taken: 22.826 seconds
hive> select * from student;
OK
101    Manav   Computer        123456 2023-03-09
102    Devraj Computer         341256 2023-03-09 Time taken: 0.319 seconds, Fetched: 2 row(s)
```

# Rename a table using the ALTER statement

```
hive> alter table student rename to stud;
OK
Time taken: 0.539 seconds
```

# Check whether table is renamed

```
hive> show tables;
OK
stud
values__tmp___table___1
values__tmp___table___2
values_tmp_table_3
Time taken: 0.119 seconds, Fetched: 4 row(s)
```

# Add new column in the table using ALTER statement

```
hive> alter table stud add columns(cgpa double);
OK
Time taken: 0.441 seconds
```

# CGPA column is added. Initially its value in all rows will be NULL as we haven't entered CGPA value.

```
hive> select * from stud;
OK
101    Manav Computer          123456 NULL 2023-03-09
102    Devraj  Computer        341256 NULL 2023-03-09
Time taken: 0.241 seconds, Fetched: 2 row(s)
```

# Changing Column Name with ALTER statement and also changing the datatype from varchar to String.

```
hive> ALTER TABLE stud CHANGE name sname String;
OK
Time taken: 0.478 seconds
```

# Updating the CGPA values in table (i.e. changing the NULL Value)

```
hive> update stud set cgpa = 7.9 where id = 101;
Query ID = root_20230309071806_94217582-6ff2-408e-addf-3af8a3655e94
Total jobs = 1
Launching Job 1 out of 1
Tez session was closed. Reopening... Session
re-established.
Status: Running (Executing on YARN cluster with App id application_1678329811540_0005)

-------------------------------------------------------------------------
      VERTICES       STATUS TOTAL COMPLETED RUNNING PENDING FAILED KILLED
-------------------------------------------------------------------------

 Map 1 .......... SUCCEEDED      3        3       0       0      0      0
Reducer 2 ........SUCCEEDED      1        1       0       0      0      0
-------------------------------------------------------------------------
VERTICES: 02/02 [==========================>>] 100% ELAPSED TIME: 33.39 s
-------------------------------------------------------------------------
```

```
Loading data to table studentdb.stud partition (load_date=null)
        Time taken for load dynamic partitions : 417
       Loading partition {load_date=2023-03-09}
        Time taken for adding to write entity : 0
Partition  studentdb.stud{load_date=2023-03-09}  stats:  [numFiles=6,  numRows=0,  totalSize=4956,
rawDataSize=0]
OK
Time taken: 45.136 seconds
```

```
hive> update stud set cgpa = 8.8 where id = 102;
Query ID = root_20230309071919_6f74a8dc-b5a9-406b-81af-fea4bc3a09e8
Total jobs = 1
Launching Job 1 out of 1
Status: Running (Executing on YARN cluster with App id application_1678329811540_0005)

--------------------------------------------------------------------------------
       VERTICES       STATUS TOTAL COMPLETED RUNNING PENDING FAILED KILLED
--------------------------------------------------------------------------------


 Map 1 .......... SUCCEEDED      3        3       0       0      0      0
Reducer 2 ........SUCCEEDED      1        1       0       0      0      0
--------------------------------------------------------------------------------
VERTICES: 02/02 [==========================>>] 100% ELAPSED TIME: 12.69 s
--------------------------------------------------------------------------------

Loading data to table studentdb.stud partition (load_date=null)
        Time taken for load dynamic partitions : 183
       Loading partition {load_date=2023-03-09}
        Time taken for adding to write entity : 1
Partition  studentdb.stud{load_date=2023-03-09}  stats:  [numFiles=7,  numRows=0,  totalSize=5926,
rawDataSize=0]
OK
Time taken: 14.739 seconds
```

# Check whether the CGPA values are updated.

```
hive> select * from stud;

OK
101    Manav Computer           123456 7.9       2023-03-09
102    Devraj Computer 341256 8.8       2023-03-09
Time taken: 0.196 seconds, Fetched: 2 row(s)
```

# Performing Aggregate Functions (SUM, MAX, MIN, AVG, COUNT) on table

```
hive> select sum(cgpa) from stud;

Query   ID   =   root_20230309074116_00e58970-8700-4fd9-897b-15e8ce2a3d5c
Total jobs = 1
Launching Job 1 out of 1
Tez session was closed. Reopening...
Session re-established.

Status: Running (Executing on YARN cluster with App id application_1678329811540_0006)
```

```
----------------------------------------------------------------------
      VERTICES       STATUS TOTAL COMPLETED RUNNING PENDING FAILED KILLED
----------------------------------------------------------------------

 Map 1 .......... SUCCEEDED      3        3      0       0      0      0
Reducer 2 ........SUCCEEDED      1        1      0       0      0      0
----------------------------------------------------------------------
VERTICES: 02/02 [==========================>>] 100% ELAPSED TIME: 25.89 s
----------------------------------------------------------------------

OK
16.700000000000003

Time taken: 39.321 seconds, Fetched: 1 row(s)

hive> select max(cgpa) from stud;
Query   ID   =   root_20230309074240_a75dc01e-f8c6-4694-b6d1-45012b7652e6
Total jobs = 1
Launching Job 1 out of 1

Status: Running (Executing on YARN cluster with App id application_1678329811540_0006)

----------------------------------------------------------------------
      VERTICES       STATUS TOTAL COMPLETED RUNNING PENDING FAILED KILLED
----------------------------------------------------------------------

 Map 1 .......... SUCCEEDED      3        3      0       0      0      0
Reducer 2 ........SUCCEEDED      1        1      0       0      0      0
----------------------------------------------------------------------
VERTICES: 02/02 [==========================>>] 100% ELAPSED TIME: 12.20 s
----------------------------------------------------------------------

OK
8.8

Time taken: 14.61 seconds, Fetched: 1 row(s)

hive> select min(cgpa) from stud;
Query   ID   =   root_20230309074335_8d8c7447-1684-4fd0-b3b2-06db2cb8a439
Total jobs = 1
Launching Job 1 out of 1

Status: Running (Executing on YARN cluster with App id application_1678329811540_0006)

----------------------------------------------------------------------
      VERTICES       STATUS TOTAL COMPLETED RUNNING PENDING FAILED KILLED
----------------------------------------------------------------------
 Map 1 .......... SUCCEEDED      3        3      0       0      0      0
Reducer 2 ........SUCCEEDED      1        1      0       0      0      0
```

```
VERTICES: 02/02 [========================>>] 100% ELAPSED TIME: 18.26 s
--------------------------------------------------------------------

OK
7.9

Time taken: 19.969 seconds, Fetched: 1 row(s)

hive> select avg(cgpa) from stud;
Query   ID   =   root_20230309074547_64a6e36d-247e-418c-88d1-c1ebc565e734
Total jobs = 1
Launching Job 1 out of 1

Status: Running (Executing on YARN cluster with App id application_1678329811540_0006)

--------------------------------------------------------------------
     VERTICES      STATUS TOTAL COMPLETED RUNNING PENDING FAILED KILLED


 Map 1 .......... SUCCEEDED      3       3      0      0     0     0
Reducer 2 ........SUCCEEDED      1       1      0      0     0     0

VERTICES: 02/02 [========================>>] 100% ELAPSED TIME: 16.41 s
--------------------------------------------------------------------

OK
8.350000000000001

Time taken: 18.007 seconds, Fetched: 1 row(s)

hive> select count(cgpa) from stud;
Query   ID   =   root_20230309074649_0342e8d0-ab88-40a0-9306-16aca6cdb51e
Total jobs = 1
Launching Job 1 out of 1
Status: Running (Executing on YARN cluster with App id application_1678329811540_0006)

--------------------------------------------------------------------
     VERTICES      STATUS TOTAL COMPLETED RUNNING PENDING FAILED KILLED


 Map 1 .......... SUCCEEDED      3       3      0      0     0     0
Reducer 2 ........SUCCEEDED      1       1      0      0     0     0

VERTICES: 02/02 [========================>>] 100% ELAPSED TIME: 8.17 s
--------------------------------------------------------------------

OK
2
Time taken: 9.295 seconds, Fetched: 1 row(s)
```

# Operators in HIVE (Arithmetic, Relational, Logical)

Relational Operators

These operators are used to compare two operands. The following table describes the relational operators available in Hive:

Operator	Operand	Description
A = B	all primitive types	TRUE if expression A is equivalent to expression B otherwise FALSE.
A != B	all primitive types	TRUE if expression A is not equivalent to expression B otherwise FALSE.
A < B	all primitive types	TRUE if expression A is less than expression B otherwise FALSE.
A <= B	all primitive types	TRUE if expression A is less than or equal to expression B otherwise FALSE.
A > B	all primitive types	TRUE if expression A is greater than expression B otherwise FALSE.
A >= B	all primitive types	TRUE if expression A is greater than or equal to expression B otherwise FALSE.
A IS NULL	all types	TRUE if expression A evaluates to NULL otherwise FALSE.
A IS NOT NULL	all types	FALSE if expression A evaluates to NULL otherwise TRUE.
A LIKE B	Strings	TRUE if string pattern A matches to B otherwise FALSE.
A RLIKE B	Strings	NULL if A or B is NULL, TRUE if any substring of A matches the Java regular expression B , otherwise FALSE.
A REGEXP B	Strings	Same as RLIKE.

Arithmetic Operators

These operators support various common arithmetic operations on the operands. All of them return number types. The following table describes the arithmetic operators available in Hive:

Operators	Operand	Description
A + B	all number types	Gives the result of adding A and B.
A - B	all number types	Gives the result of subtracting B from A.
A * B	all number types	Gives the result of multiplying A and B.
A / B	all number types	Gives the result of dividing B from A.
A % B	all number types	Gives the reminder resulting from dividing A by B.
A & B	all number types	Gives the result of bitwise AND of A and B.
A | B	all number types	Gives the result of bitwise OR of A and B.
A ^ B	all number types	Gives the result of bitwise XOR of A and B.
~A	all number types	Gives the result of bitwise NOT of A.

Logical Operators

The operators are logical expressions. All of them return either TRUE or FALSE.

Operators	Operands	Description
A AND B	boolean	TRUE if both A and B are TRUE, otherwise FALSE.

A && B	boolean	Same as A AND B.
A OR B	boolean	TRUE if either A or B or both are TRUE, otherwise FALSE.
A || B	boolean	Same as A OR B.
NOT A	boolean	TRUE if A is FALSE, otherwise FALSE.
!A	boolean	Same as NOT A.

```
hive> select * from stud where cgpa < 9.0;
OK
101    Manav Computer       123456 7.9       2023-03-09
102    Devraj Computer      341256 8.8       2023-03-09
       Time taken: 0.473 seconds, Fetched: 2 row(s)
```

```
hive> select * from stud where cgpa >= 7.5;
OK
101    Manav Computer       123456 7.9       2023-03-09
102    Devraj Computer      341256 8.8       2023-03-09
       Time taken: 0.219 seconds, Fetched: 2 row(s)
```

# Joins in HIVE

Basically, for combining specific fields from two tables by using values common to each one we use Hive JOIN clause.
In other words, to combine records from two or more tables in the database we use JOIN clause. **Types of Joins in Hive**

1. **Inner join in Hive 2. Left Outer Join in Hive 3. Right Outer Join in Hive 4. Full Outer Join in Hive**

a. Inner Join
Basically, to combine and retrieve the records from multiple tables we use Hive Join clause. Moreover, by **using the primary keys and foreign keys** of the tables JOIN condition is to be raised.

b. Left Outer Join
On defining HiveQL Left Outer Join, even if there are no matches in the right table it returns all the rows from the left table.
To be more specific, even if the ON clause matches 0 (zero) records in the right table, then also this Hive JOIN still returns a row in the result. Although, it returns with NULL in each column from the right table.
In addition, it returns all the values from the left table. Also, the matched values from the right table, or NULL in case of no matching JOIN predicate.

c. Right Outer Join
Basically, even if there are no matches in the left table, HiveQL Right Outer Join returns all the rows from the right table.
To be more specific, even if the ON clause matches 0 (zero) records in the left table, then also this Hive JOIN still returns a row in the result. Although, it returns with NULL in each column from the left table.
In addition, it returns all the values from the right table. Also, the matched values from the left table or NULL in case of no matching join predicate.

d. Full Outer Join

The major purpose of this HiveQL Full outer Join is it combines the records of both the left and the right outer tables which fulfills the Hive JOIN condition. Moreover, this joined table contains either all the records from both the tables or fills in NULL values for missing matches on either side.

# Creating and inserting values in 2 tables namely, customers and orders to execute JOINS in HIVE.

```
hive> create table customers(id int, name String, age int, address String, salary int)
> partitioned by (load_date date)
> clustered by(id) into 3 buckets
> stored as orc tblproperties ('transactional'='true');
OK
Time taken: 0.842 seconds
```

```
hive> insert into customers partition (load_date = '2023-03-09') values
(1,"Ross",25,"Mumbai",25000);
Query ID = root_20230309080253_358e5b90-f99b-4fc3-a2cd-41571ab6b21c
Total jobs = 1
Launching Job 1 out of 1
Tez session was closed. Reopening...
Session re-established.
Status: Running (Executing on YARN cluster with App id application_1678329811540_0007)

----------------------------------------------------------------------------------------------
     VERTICES    STATUS TOTAL COMPLETED RUNNING  PENDING FAILED KILLED
----------------------------------------------------------------------------------------------
Map 1 ..........  SUCCEEDED   1      1      0      0     0     0
----------------------------------------------------------------------------------------------




VERTICES: 01/01 [==========================>>] 100% ELAPSED TIME: 5.21 s

----------------------------------------------------------------------
Loading data to table studentdb.customers partition (load_date=2023-03-09)
Partition studentdb.customers{load_date=2023-03-09} stats: [numFiles=1, numRows=0,
totalSize=865, rawDataSize=0]
OK
Time taken: 14.342 seconds
```

```
hive> insert into customers partition (load_date = '2023-03-09') values
(2,"Mike",27,"Bhopal",35000);
Query ID = root_20230309080416_207775fb-ecc4-40c0-a216-281a829b9581
Total jobs = 1
Launching Job 1 out of 1

Status: Running (Executing on YARN cluster with App id application_1678329811540_0007)
```

```
--------------------------------------------------------------------
      VERTICES       STATUS TOTAL COMPLETED RUNNING PENDING FAILED KILLED
--------------------------------------------------------------------
 Map 1 .......... SUCCEEDED      1         1       0       0       0      0

--------------------------------------------------------------------
VERTICES: 01/01 [==========================>>] 100% ELAPSED TIME: 7.01 s
--------------------------------------------------------------------

Loading data to table studentdb.customers partition (load_date=2023-03-09)
Partition studentdb.customers{load_date=2023-03-09} stats: [numFiles=2, numRows=0,
totalSize=1735, rawDataSize=0]
OK
Time taken: 8.722 seconds
```

```
hive> insert into customers partition (load_date = '2023-03-10')values(3,"Albin",24,"Pune",50000);
```

```
Query ID = root_20230309085540_1bc1239b-2b0d-444f-bea5-e1c69576df93
Total jobs = 1
Launching Job 1 out of 1

Status: Running (Executing on YARN cluster with App id application_1678329811540_0008)


--------------------------------------------------------------------
      VERTICES       STATUS TOTAL COMPLETED RUNNING PENDING FAILED KILLED

--------------------------------------------------------------------
 Map 1 .......... SUCCEEDED      1         1       0       0       0      0
--------------------------------------------------------------------

VERTICES: 01/01 [==========================>>] 100% ELAPSED TIME: 3.34 s
--------------------------------------------------------------------

Loading data to table studentdb.customers partition (load_date=2023-03-10)
Partition studentdb.customers{load_date=2023-03-10} stats: [numFiles=1, numRows=0,
totalSize=863, rawDataSize=0]
OK
Time taken: 5.857 seconds
```

```
hive> select * from customers;
OK
1       Ross   25    Mumbai 25000 2023-03-09
2       Mike   27    Bhopal 35000 2023-03-09
3       Albin 24     Pune 50000 2023-03-10
Time taken: 0.302 seconds, Fetched: 3 row(s)
```

```
hive> create table orders(oid int, customer_id int, amount int);
```

```
OK
Time taken: 0.606 seconds
```

```
hive> insert into orders values(101, 2, 20000);
```

```
hive> insert into orders values(102, 2, 25000);
hive> insert into orders values(104,4,10000);
hive> select * from orders;
OK
101    2         20000
102    2         25000
103    1         30000
104    4         10000
Time taken: 0.174 seconds, Fetched: 4 row(s)
```

# Executing Inner Join

```
hive> select * from customers c join orders o >
   on (c.id = o.customer_id);
Query ID = root_20230309090029_4b55b07e-4508-478f-a05b-4eaca94e4190
Total jobs = 1
Launching Job 1 out of 1
Status: Running (Executing on YARN cluster with App id
application_1678329811540_0008)
  ----------------------------------------------------------------
      VERTICES       STATUS TOTAL COMPLETED RUNNING PENDING FAILED KILLED
  ----------------------------------------------------------------
Map 1 ............ SUCCEEDED     6        6       0       0      0      0
Map 2 ............ SUCCEEDED     1        1       0       0      0      0
  ----------------------------------------------------------------
VERTICES: 02/02 [==========================>>] 100% ELAPSED TIME: 19.48 s
  ----

OK
1      Ross 25     Mumbai 25000 2023-03-09        103       1          30000
2      Mike         27         Bhopal 35000 2023-03-09         101       2          20000
2      Mike    27        Bhopal 35000 2023-03-09       102     2      25000
Time taken: 20.319 seconds, Fetched: 3 row(s)
```

# Executing LEFT OUTER JOIN

```
hive> select * from customers c left outer join orders o
   > on (c.id = o.customer_id);
Query ID = root_20230309090159_2d9c595a-7a7b-45d5-ad28-81e65ac22b64
Total jobs = 1
Launching Job 1 out of 1
Status: Running (Executing on YARN cluster with App id application_1678329811540_0008)
----------------------------------------------------------------------------
     VERTICES    STATUS  TOTAL  COMPLETED  RUNNING  PENDING  FAILED  KILLED
----------------------------------------------------------------------------
Map 1...........SUCCEEDED     6       6      0       0      0      0
Map 2...........SUCCEEDED     1       1      0       0      0      0
----------------------------------------------------------------------------
VERTICES: 02/02  [==========================>>]  100%  ELAPSED TIME: 13.92 s
----------------------------------------------------------------------------
OK
1     Ross   25     Mumbai  25000   2023-03-09     103    1     30000
2     Mike   27     Bhopal  35000   2023-03-09     101    2     20000
2     Mike      27        Bhopal 35000   2023-03-09        102       2          25000
3     Albin 24            Pune   50000 2023-03-10          NULL NULL NULL Time taken: 15.026 seconds,
      Fetched: 4 row(s)
```

```
select * from customers c right outer join orders o >
   on (c.id = o.customer_id);
Query ID = root_20230309090237_47fe2670-0826-4677-845e-b2cd58660148
Total jobs = 1
Launching Job 1 out of 1
Status: Running (Executing on YARN cluster with App id
application_1678329811540_0008)
  ----------------------------------------------------------------------
      VERTICES       STATUS TOTAL COMPLETED RUNNING PENDING FAILED KILLED
  ----------------------------------------------------------------------
Map 1 ............ SUCCEEDED     6        6      0      0      0      0
Map 2 ............ SUCCEEDED     1        1      0      0      0      0
  ----------------------------------------------------------------------
VERTICES: 02/02 [==========================>>] 100% ELAPSED TIME: 10.82 s
  ---------

OK
2      Mike    27      Bhopal 35000 2023-03-09        101     2      20000
2      Mike    27      Bhopal 35000 2023-03-09        102     2      25000
1      Ross    25      Mumbai 25000 2023-03-09       103     1      30000
NULL   NULL   NULL   NULL   NULL   NULL   104         4      10000
Time taken: 11.516 seconds, Fetched: 4 row(s)
```

# Executing RIGHT OUTER JOIN

# Executing FULL OUTER JOIN

```
hive> select * from customers c full outer join orders o
   > on (c.id = o.customer_id);
Query ID = root_20230309090307_762521ad-0c69-4310-83f2-5d8061121d8a
Total jobs = 1
Launching Job 1 out of 1
Status: Running (Executing on YARN cluster with App id application_1678329811540_0008)
----------------------------------------------------------------------------
     VERTICES    STATUS  TOTAL  COMPLETED  RUNNING  PENDING  FAILED  KILLED
----------------------------------------------------------------------------
Map 1...........SUCCEEDED     6       6      0      0     2     0
Map 3...........SUCCEEDED     1       1      0      0     0     0
Reducer 2 ........SUCCEEDED     1       1      0      0     0     0
----------------------------------------------------------------------------
VERTICES: 03/03  [==========================>>]  100%  ELAPSED TIME: 18.78 s
----------
OK
1     Ross   25     Mumbai  25000   2023-03-09     103    1      30000
2     Mike    27     Bhopal   35000   2023-03-09     101    2      20000
2     Mike    27     Bhopal   35000   2023-03-09     102    2      25000
3     Albin  24     Pune       50000   2023-03-10     NULL   NULL   NULL
NULL NULL NULL NULL NULL NULL 104                    4      10000
Time taken: 19.841 seconds, Fetched: 5 row(s)
```

# Views in HIVE

Views are generated based on user requirements. You can save any result set data as a view. The usage of view in Hive is same as that of the view in SQL. It is a standard RDBMS concept. We can execute all DML operations on a view.

# Creating a View on customers table for address Mumbai.

```
hive> create view if not exists customers_vw
> as select * from customers where address="Mumbai";
OK
Time taken: 0.248 seconds
```

# Displaying the results of above view

```
hive> select * from customers_vw;
OK
1       Ross   25           Mumbai 25000 2023-03-09 Time taken: 0.146 seconds, Fetched: 1 row(s)
```

# Creating a view on complete customers table instead of one single row (condition based)

```
hive> alter view customers_vw as select * from customers;
OK
Time taken: 0.212 seconds
```

# Displaying the results of above view

```
hive> select * from customers_vw;
OK
1       Ross   25    Mumbai 25000 2023-03-09
2       Mike   27    Bhopal 35000 2023-03-09
Time taken: 0.11 seconds, Fetched: 2 row(s)
```

# Dropping the view created

```
hive> drop view if exists customers_vw;
OK
Time taken: 0.462 seconds hive> select * from customers_vw;
FAILED: SemanticException [Error 10001]: Line 1:14 Table not found 'customers_vw'
```