**Ex No 5**

# Create tables in Hive and write queries to access the data in the table

**AIM:**

To create tables in Hive and write queries to access the data in the table.

**PROCEDURE:**

## 1. Download Hive and Derby

- **Apache Hive**: Download from Hive Download
- **Apache Derby**: Download from Derby Download

Extract both `.tar.gz` files after downloading.

## 2. Move Hive and Derby to `/usr/local/`

Open **Terminal**.

Navigate to the folder where the downloaded files are located. For example, if they are in your `Downloads` folder:

```
cd ~/Downloads
```

Move the extracted Hive and Derby folders to `/usr/local/`.
For Hive:

```
sudo mv apache-hive-3.1.3-bin /usr/local/
```
For Derby:

```
sudo mv db-derby-10.14.2.0-bin /usr/local/
```
Verify that the folders were successfully moved:

```
cd /usr/local/
ls
```
You should see `apache-hive-3.1.3-bin` and `db-derby-10.14.2.0-bin` listed.

## 3. Set Environment Variables

Open your `._profile` or `.zshrc` (depending on your shell) in a text editor. Most likely, you are using Zsh on newer macOS versions, so edit `.zshrc`:

```
nano ~/.zshrc
```

Add the following lines to set the environment variables for Hive and Derby:

```
# Set Hive environment variables
export HIVE_HOME=/usr/local/apache-hive-3.1.3-bin
export PATH=$PATH:$HIVE_HOME/bin

# Set Derby environment variables
export DERBY_HOME=/usr/local/db-derby-10.14.2.0-bin
export PATH=$PATH:$DERBY_HOME/bin
```

Save and exit (`Ctrl + O` to save, then `Ctrl + X` to exit).

Apply the changes by running the following command:

```
source ~/.zshrc
```

cd /usr/local/db-derby-10.14.2.0-bin/lib
cp *.jar /usr/local/apache-hive-3.1.3-bin/lib/

https://1drv.ms/f/s!ArSg3Xpur4Grmw0SDqW0g44T7HYU?e=wDsoBn

Download all

## Move and Replace `hive-site.xml`

**Navigate to Hive Configuration Directory:**

```
cd /usr/local/apache-hive-3.1.3-bin/conf
```

**Backup Existing `hive-site.xml` (if it exists):**

```
mv hive-site.xml hive-site.xml.bak
```

**Copy the Downloaded `hive-site.xml` from Downloads:**

```
cp ~/Downloads/hive-site.xml .
```

## Replace the Guava Library

**Navigate to Hive's Libraries Directory:**

```
cd /usr/local/apache-hive-3.1.3-bin/lib
```

**Backup Existing Guava Library (if it exists):**

```
mv guava-*.jar guava-*.jar.bak
```

**Copy the Downloaded Guava Library from Downloads:**

```
cp ~/Downloads/guava-*.jar .
```

Ensure you replace `guava-*.jar` with the actual filename of the Guava library you downloaded.

## Replace the Bin Folder

**Navigate to Hive Installation Directory:**

```
cd /usr/local/apache-hive-3.1.3-bin
```

**Backup Existing `bin` Directory:**

```
mv bin bin.bak
```

**Copy the Downloaded `bin` Directory from Downloads:**

```
cp -r ~/Downloads/bin .
```

## Verify Installation

**Navigate to Hive's Bin Directory:**

```
cd /usr/local/apache-hive-3.1.3-bin/bin
```

**Check Hive Version to Verify Installation:**

```
cd /usr/local/apache-hive-3.1.3-bin/bin
```

```
chmod +x hive
```

## 4. Test Hive and Derby Installation

To test if Hive is working, run:

```
hive --version
```
You should see the version of Hive that you installed.

To test if Derby is working, run:

```
sudo java -jar $DERBY_HOME/lib/derbyrun.jar server start
```
You should see a message saying the Derby server started successfully.

## 5. Start Hadoop Services (if Hadoop is Installed)

If Hadoop is set up on your system, you'll need to start the Hadoop services for Hive to run:

Open a new terminal and go to Hadoop's `sbin` directory:

```
cd /path/to/hadoop/sbin
```
Start the Hadoop services:

```
start-dfs.sh
start-yarn.sh
```

## 6. Configure Hive Schema with Derby

Now, initialize the Hive schema with Derby as the metastore:

Open a new terminal and run the following command to initialize the schema:

```
hive --service schematool -dbType derby -initSchema
```

## 7. Open the Hive Shell

Now, you can open the Hive shell and start working with Hive:

Open the Hive shell by typing:

```
hive
```
Verify that Hive is running correctly by creating a database and listing it:

```
CREATE DATABASE financials;
SHOW DATABASES;
```

```
hive> show databases;
2024-09-08 19:28:14,778 INFO conf.HiveConf: Using the default value passed in for log id: 168ffab1-50a4-42fa-b931-df2184794e2e
2024-09-08 19:28:14,966 INFO ql.Driver: Compiling command(queryId=user_20240908192814_5a0bb98c-9d8d-41ec-9ae0-4b59b629930a): show databases
2024-09-08 19:28:15,646 INFO ql.Driver: Concurrency mode is disabled, not creating a lock manager
2024-09-08 19:28:15,687 INFO ql.Driver: Semantic Analysis Completed (retrial = false)
2024-09-08 19:28:15,816 INFO ql.Driver: Returning Hive schema: Schema(fieldSchemas:[FieldSchema(name:database_name, type:string, comment:from deserializer)], properties:null)
2024-09-08 19:28:15,996 INFO exec.ListSinkOperator: Initializing operator LIST_SINK[0]
2024-09-08 19:28:16,017 INFO ql.Driver: Completed compiling command(queryId=user_20240908192814_5a0bb98c-9d8d-41ec-9ae0-4b59b629930a); Time taken: 1.137 seconds
2024-09-08 19:28:16,017 INFO reexec.ReExecDriver: Execution #1 of query
2024-09-08 19:28:16,020 INFO ql.Driver: Concurrency mode is disabled, not creating a lock manager
2024-09-08 19:28:16,020 INFO ql.Driver: Executing command(queryId=user_20240908192814_5a0bb98c-9d8d-41ec-9ae0-4b59b629930a): show databases
2024-09-08 19:28:16,047 INFO ql.Driver: Starting task [Stage-0:DDL] in serial mode
2024-09-08 19:28:16,050 INFO metastore.HiveMetaStore: 0: get_databases: @hive#
2024-09-08 19:28:16,050 INFO HiveMetaStore.audit: ugi=user      ip=unknown-ip-addr      cmd=get_databases: @hive#
2024-09-08 19:28:16,053 INFO exec.DDLTask: results : 3
2024-09-08 19:28:16,120 INFO ql.Driver: Completed executing command(queryId=user_20240908192814_5a0bb98c-9d8d-41ec-9ae0-4b59b629930a); Time taken: 0.1 seconds
OK
2024-09-08 19:28:16,122 INFO ql.Driver: OK
2024-09-08 19:28:16,125 INFO ql.Driver: Concurrency mode is disabled, not creating a lock manager
2024-09-08 19:28:16,146 INFO Configuration.deprecation: mapred.input.dir is deprecated. Instead, use mapreduce.input.fileinputformat.inputdir
2024-09-08 19:28:16,216 INFO mapred.FileInputFormat: Total input files to process : 1
2024-09-08 19:28:16,268 INFO exec.ListSinkOperator: RECORDS_OUT_INTERMEDIATE:0, RECORDS_OUT_OPERATOR_LIST_SINK_0:3,
default
financials
test
Time taken: 1.25 seconds, Fetched: 3 row(s)
2024-09-08 19:28:16,288 INFO CliDriver: Time taken: 1.25 seconds, Fetched: 3 row(s)
2024-09-08 19:28:16,289 INFO conf.HiveConf: Using the default value passed in for log id: 168ffab1-50a4-42fa-b931-df2184794e2e
2024-09-08 19:28:16,291 INFO session.SessionState: Resetting thread name to  main
```

## 8. Create a Table and Insert Data

Use the following  to create a simple table in Hive:

```
USE financials;
```

```
hive> use financials;
2024-08-30T23:36:00,862 INFO [main] org.apache.hadoop.hive.conf.HiveConf - Using the default value passed in for log id: 1c22e2df-c29b-4d8f-b0b3-63904207bbe2
2024-08-30T23:36:00,864 INFO [main] org.apache.hadoop.hive.ql.session.SessionState - Updating thread name to 1c22e2df-c29b-4d8f-b0b3-63904207bbe2 main
OK
Time taken: 0.048 seconds
2024-08-30T23:36:00,917 INFO [1c22e2df-c29b-4d8f-b0b3-63904207bbe2 main] org.apache.hadoop.hive.conf.HiveConf - Using the default value passed in for log id: 1c22e2df-c
29b-4d8f-b0b3-63904207bbe2
2024-08-30T23:36:00,918 INFO [1c22e2df-c29b-4d8f-b0b3-63904207bbe2 main] org.apache.hadoop.hive.ql.session.SessionState - Resetting thread name to  main
```

```
CREATE TABLE students_table (id INT, name STRING);
```

```
hive> CREATE TABLE finance_table(id INT, name STRING);
2024-08-30T23:36:32,350 INFO [main] org.apache.hadoop.hive.conf.HiveConf - Using the default value passed in for log id: 1c22e2df-c29b-4d8f-b0b3-63904207bbe2
2024-08-30T23:36:32,351 INFO [main] org.apache.hadoop.hive.ql.session.SessionState - Updating thread name to 1c22e2df-c29b-4d8f-b0b3-63904207bbe2 main
OK
Time taken: 0.078 seconds
2024-08-30T23:36:32,439 INFO [1c22e2df-c29b-4d8f-b0b3-63904207bbe2 main] org.apache.hadoop.hive.conf.HiveConf - Using the default value passed in for log id: 1c22e2df-c
29b-4d8f-b0b3-63904207bbe2
2024-08-30T23:36:32,440 INFO [1c22e2df-c29b-4d8f-b0b3-63904207bbe2 main] org.apache.hadoop.hive.ql.session.SessionState - Resetting thread name to  main
```

Insert some sample data:

```
INSERT INTO students_table VALUES (1, 'Alice'), (2, 'Bob'), (3,
'Charlie');
```

```
hive> INSERT INTO finance_table VALUES (1,'Alice'), (2,'Bob'), (3,'Charlie');
2024-08-30T23:37:36,149 INFO [main] org.apache.hadoop.hive.conf.HiveConf - Using the default value passed in for log id: 1c22e2df-c29b-4d8f-b0b3-63904207bbe2
2024-08-30T23:37:36,149 INFO [main] org.apache.hadoop.hive.ql.session.SessionState - Updating thread name to 1c22e2df-c29b-4d8f-b0b3-63904207bbe2 main
2024-08-30T23:37:41,265 INFO [1c22e2df-c29b-4d8f-b0b3-63904207bbe2 main] org.apache.hadoop.hive.common.FileUtils - Creating directory if it doesn't exist: hdfs://localh
ost:9000/user/hive/warehouse/financials.db/finance_table/.hive-staging_hive_2024-08-30_23-37-36_169_2114510206597313358-1
2024-08-30T23:37:41,461 INFO [1c22e2df-c29b-4d8f-b0b3-63904207bbe2 main] org.apache.hadoop.hive.common.FileUtils - Creating directory if it doesn't exist: hdfs://localh
ost:9000/tmp/hive/user/1c22e2df-c29b-4d8f-b0b3-63904207bbe2/hive_2024-08-30_23-37-41_328_1237454592308593528-1/-mr-10000/.hive-staging_hive_2024-08-30_23-37-41_328_1237
454592308593528-1
Query ID = user_20240830233736_01a5737e-9654-4013-bcdd-9071c1f42090
Total jobs = 3
Launching Job 1 out of 3
Number of reduce tasks determined at compile time: 1
In order to change the average load for a reducer (in bytes):
  set hive.exec.reducers.bytes.per.reducer=<number>
In order to limit the maximum number of reducers:
  set hive.exec.reducers.max=<number>
```

```
Launching Job 1 out of 3
Number of reduce tasks determined at compile time: 1
In order to change the average load for a reducer (in bytes):
  set hive.exec.reducers.bytes.per.reducer=<number>
In order to limit the maximum number of reducers:
  set hive.exec.reducers.max=<number>
In order to set a constant number of reducers:
  set mapreduce.job.reduces=<number>
2024-08-30T23:37:42,285 INFO [1c22e2df-c29b-4d8f-b0b3-63904207bbe2 main] org.apache.hadoop.conf.Configuration.deprecation - mapred.submit.replication is deprecated. Ins
tead, use mapreduce.client.submit.file.replication
2024-08-30T23:37:49,235 INFO [1c22e2df-c29b-4d8f-b0b3-63904207bbe2 main] org.apache.hadoop.conf.Configuration.deprecation - yarn.resourcemanager.system-metrics-publishe
r.enabled is deprecated. Instead, use yarn.system-metrics-publisher.enabled
2024-08-30T23:37:49,791 INFO [1c22e2df-c29b-4d8f-b0b3-63904207bbe2 main] org.apache.hadoop.conf.Configuration - resource-types.xml not found
Starting Job = job_1725040228625_0001, Tracking URL = http://DESKTOP-DKU83QM:8088/proxy/application_1725040228625_0001/
Kill Command = C:\hadoop\bin\mapred job  -kill job_1725040228625_0001
Hadoop job information for Stage-1: number of mappers: 1; number of reducers: 1
2024-08-30 23:38:30,410 Stage-1 map = 0%,  reduce = 0%
2024-08-30 23:38:51,438 Stage-1 map = 100%,  reduce = 0%, Cumulative CPU 6.092 sec
2024-08-30 23:39:16,522 Stage-1 map = 100%,  reduce = 100%, Cumulative CPU 11.215 sec
MapReduce Total cumulative CPU time: 11 seconds 215 msec
Ended Job = job_1725040228625_0001
Stage-4 is selected by condition resolver.
Stage-3 is filtered out by condition resolver.
Stage-5 is filtered out by condition resolver.
Moving data to directory hdfs://localhost:9000/user/hive/warehouse/financials.db/finance_table/.hive-staging_hive_2024-08-30_23-37-36_169_2114510206597313358-1/-ext-100
00
Loading data to table financials.finance_table
MapReduce Jobs Launched:
Stage-Stage-1: Map: 1  Reduce: 1   Cumulative CPU: 11.215 sec   HDFS Read: 15666 HDFS Write: 291 SUCCESS
Total MapReduce CPU Time Spent: 11 seconds 215 msec
OK
Time taken: 107.363 seconds
2024-08-30T23:39:23,519 INFO [1c22e2df-c29b-4d8f-b0b3-63904207bbe2 main] org.apache.hadoop.hive.conf.HiveConf - Using the default value passed in for log id: 1c22e2df-c
29b-4d8f-b0b3-63904207bbe2
2024-08-30T23:39:23,519 INFO [1c22e2df-c29b-4d8f-b0b3-63904207bbe2 main] org.apache.hadoop.hive.ql.session.SessionState - Resetting thread name to  main
```

## 9. Query the Data

Query the data to verify everything is working:

```
SELECT * FROM students_table;
```

```
2024-09-10 21:55:31,579 INFO mapred.FileInputFormat: Total input files to process : 1
2024-09-10 21:55:31,591 INFO exec.TableScanOperator: RECORDS_OUT_INTERMEDIATE:0, RECORDS_OUT_OPERATOR_TS_0:3,
2024-09-10 21:55:31,591 INFO exec.SelectOperator: RECORDS_OUT_INTERMEDIATE:0, RECORDS_OUT_OPERATOR_SEL_1:3,
2024-09-10 21:55:31,591 INFO exec.ListSinkOperator: RECORDS_OUT_INTERMEDIATE:0, RECORDS_OUT_OPERATOR_LIST_SINK_3:3,
1       Alice
2       Bob
3       Charlie
Time taken: 0.354 seconds, Fetched: 3 row(s)
2024-09-10 21:55:31,593 INFO CliDriver: Time taken: 0.354 seconds, Fetched: 3 row(s)
2024-09-10 21:55:31,593 INFO conf.HiveConf: Using the default value passed in for log id: 79e4878f-fb4d-4f68-9f0b-ba4ecde738ef
2024-09-10 21:55:31,593 INFO session.SessionState: Resetting thread name to  main
hive>
```

## 10. Shut Down Hive and Derby

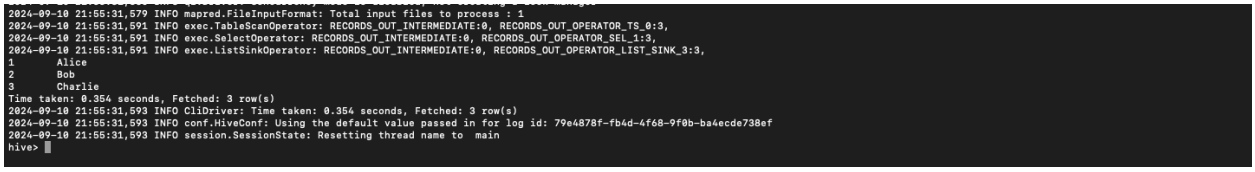
Exit the Hive shell by typing `quit;`.

Stop the Derby server by running:

```
sudo java -jar $DERBY_HOME/lib/derbyrun.jar server shutdown
```

## OUTPUT:

```
nativewit@Nativewits-MacBook-Air ~ % cd /usr/local/db-derby-10.14.2.0/lib

cd: no such file or directory: /usr/local/db-derby-10.14.2.0/lib
nativewit@Nativewits-MacBook-Air ~ % cd /usr/local/
nativewit@Nativewits-MacBook-Air local % ls
Caskroom                db-derby-10.14.2.0-bin  pig
Cellar                  derby.log               sbin
Frameworks              etc                     share
Homebrew                include                 var
apache-hive-3.1.3-bin   lib
bin                     opt
nativewit@Nativewits-MacBook-Air local % cd /usr/local/db-derby-10.14.2.0-bin/lib
nativewit@Nativewits-MacBook-Air lib % cp *.jar /usr/local/apache-hive-3.1.3-bin/lib/

nativewit@Nativewits-MacBook-Air lib % cd /usr/local/apache-hive-3.1.3-bin/conf

nativewit@Nativewits-MacBook-Air conf % mv hive-site.xml hive-site.xml.bak

mv: rename hive-site.xml to hive-site.xml.bak: No such file or directory
nativewit@Nativewits-MacBook-Air conf % cp ~/Downloads/hive-site.xml .

cp: /Users/nativewit/Downloads/hive-site.xml: No such file or directory
nativewit@Nativewits-MacBook-Air conf % cp ~/Downloads/hive-site.xml .

nativewit@Nativewits-MacBook-Air conf % cd /usr/local/apache-hive-3.1.3-bin/lib

nativewit@Nativewits-MacBook-Air lib % mv guava-*.jar guava-*.jar.bak

zsh: no matches found: guava-*.jar.bak
nativewit@Nativewits-MacBook-Air lib % cp ~/Downloads/guava-*.jar .

nativewit@Nativewits-MacBook-Air lib % cd /usr/local/apache-hive-3.1.3-bin

nativewit@Nativewits-MacBook-Air apache-hive-3.1.3-bin % mv bin bin.bak

nativewit@Nativewits-MacBook-Air apache-hive-3.1.3-bin % cp -r ~/Downloads/bin .

nativewit@Nativewits-MacBook-Air apache-hive-3.1.3-bin % cd /usr/local/apache-hive-3.1.3-bin/bin

nativewit@Nativewits-MacBook-Air bin % ./hive --version

zsh: permission denied: ./hive
nativewit@Nativewits-MacBook-Air bin % cd /usr/local/apache-hive-3.1.3-bin/bin

nativewit@Nativewits-MacBook-Air bin % chmod +x hive

nativewit@Nativewits-MacBook-Air bin % ./hive --version

SLF4J: Class path contains multiple SLF4J bindings.
SLF4J: Found binding in [jar:file:/usr/local/Cellar/hadoop/3.4.0/libexec/share/hadoop/common/lib/slf4j-reload4j-1.7.36.jar!/org/slf4j/impl/StaticLoggerBinder.class]
SLF4J: Found binding in [jar:file:/usr/local/apache-hive-3.1.3-bin/lib/log4j-slf4j-impl-2.17.1.jar!/org/slf4j/impl/StaticLoggerBinder.class]
SLF4J: See http://www.slf4j.org/codes.html#multiple_bindings for an explanation.
SLF4J: Actual binding is of type [org.slf4j.impl.Reload4jLoggerFactory]
SLF4J: Class path contains multiple SLF4J bindings.
SLF4J: Found binding in [jar:file:/usr/local/Cellar/hadoop/3.4.0/libexec/share/hadoop/common/lib/slf4j-reload4j-1.7.36.jar!/org/slf4j/impl/StaticLoggerBinder.class]
SLF4J: Found binding in [jar:file:/usr/local/apache-hive-3.1.3-bin/lib/log4j-slf4j-impl-2.17.1.jar!/org/slf4j/impl/StaticLoggerBinder.class]
SLF4J: See http://www.slf4j.org/codes.html#multiple_bindings for an explanation.
SLF4J: Actual binding is of type [org.slf4j.impl.Reload4jLoggerFactory]
Hive 3.1.3
Git git://MacBook-Pro.fios-router.home/Users/ngangam/commit/hive -r 4df4d75bf1e16fe0af75aad0b4179c34c07fc975
Compiled by ngangam on Sun Apr 3 16:58:16 EDT 2022
From source with checksum 5da234766db5dfbe3e92926c9bbab2af
nativewit@Nativewits-MacBook-Air bin % sudo java -jar $DERBY_HOME/lib/derbyrun.jar server start
```


**RESULT:**

Thus, to create tables in Hive and write queries to access the data in the table was completed successfully.