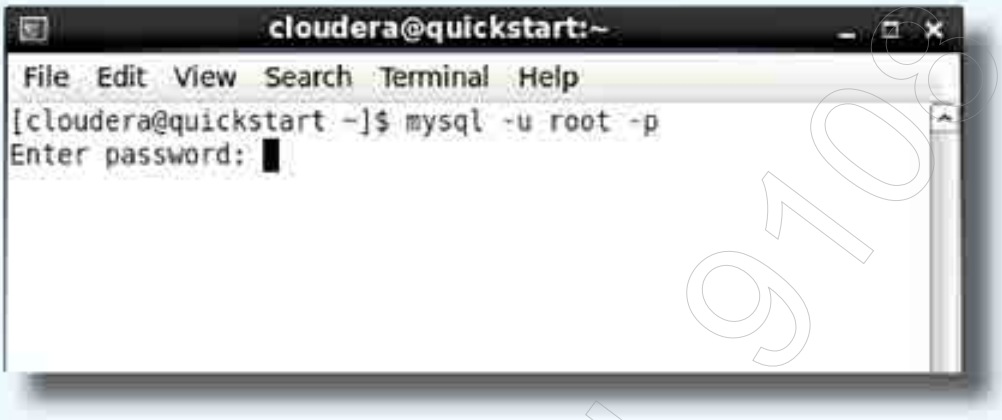
Apache Sqoop Exercise 3

Sqoop Export

Login to MySQL

```
mysql -u root -p
```




```
Enter password: cloudera
```

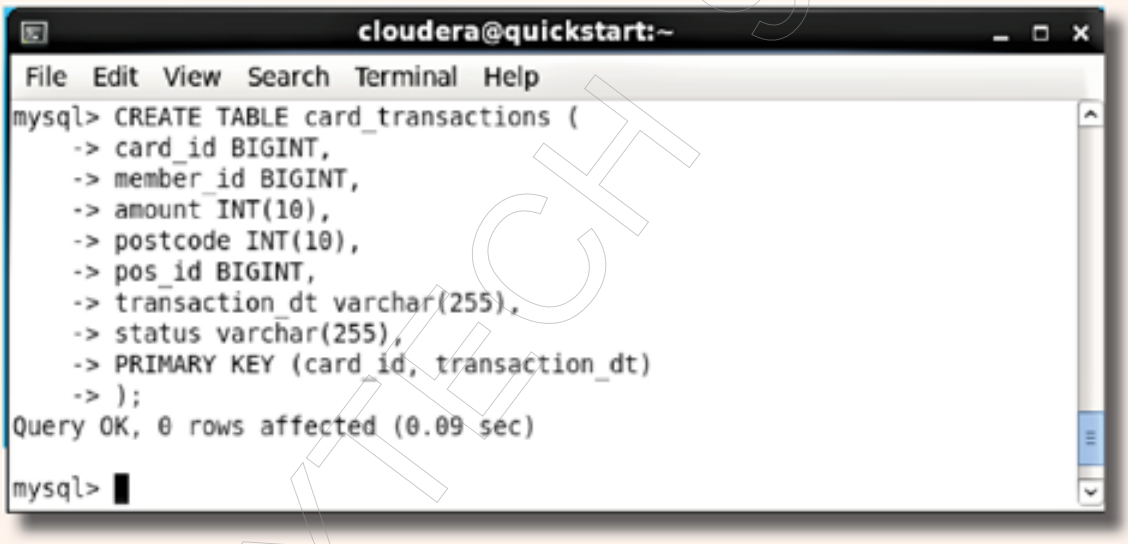
Create a database (*banking*) and use it in MySQL:

```
create database banking;

use banking;
```

Create a table (card_transactions) inside banking database of MySQL:

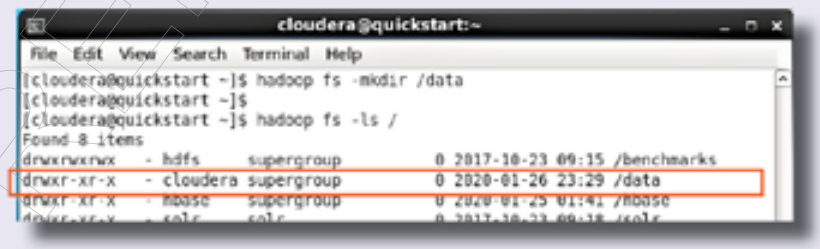
```
CREATE TABLE card_transactions (
card_id BIGINT,
member_id BIGINT,
amount INT(10),
postcode INT(10),
pos_id BIGINT,
transaction_dt varchar(255),
status varchar(255),
PRIMARY KEY (card_id, transaction_dt)
);
```

composite primary key



Create a directory inside HDFS:

```
hadoop fs -mkdir /data
```



No need to create, if already available

Move the csv file (*card_transactions*) to the HDFS *data* directory:

```
hadoop fs -put /home/cloudera/Desktop/shared/card_
transactions.csv /data
```

```
cloudera@quickstart:~
File  Edit  View  Search  Terminal  Help
[cloudera@quickstart ~]$ hadoop fs -put /home/cloudera/Desktop/shared/card_transactions.csv /data
[cloudera@quickstart ~]$
[cloudera@quickstart ~]$ hadoop fs -ls /data/*
-rw-r--r--   1 cloudera supergroup    4829457 2020-01-27 01:22 /data/card_transactions.csv
[cloudera@quickstart ~]$
[cloudera@quickstart ~]$ hadoop fs -cat /data/card_transactions.csv | head
348702330256514,000037495066290,9084849,33946,614677375609919,11-02-2018 00:00:00,GENUINE
348702330256514,000037495066290,330148,33946,614677375609919,11-02-2018 00:00:00,GENUINE
348702330256514,000037495066290,136052,33946,614677375609919,11-02-2018 00:00:00,GENUINE
348702330256514,000037495066290,4310362,33946,614677375609919,11-02-2018 00:00:00,GENUINE
348702330256514,000037495066290,9097094,33946,614677375609919,11-02-2018 00:00:00,GENUINE
348702330256514,000037495066290,2291118,33946,614677375609919,11-02-2018 00:00:00,GENUINE
348702330256514,000037495066290,4900011,33946,614677375609919,11-02-2018 00:00:00,GENUINE
348702330256514,000037495066290,633447,33946,614677375609919,11-02-2018 00:00:00,GENUINE
348702330256514,000037495066290,6259303,33946,614677375609919,11-02-2018 00:00:00,GENUINE
348702330256514,000037495066290,369067,33946,614677375609919,11-02-2018 00:00:00,GENUINE
cat: Unable to write to output stream.
[cloudera@quickstart ~]$
```

To check number of records present in a HDFS file (*card_transactions*) :

```
hadoop fs -cat /data/card_transactions.csv | wc -l
```

```
cloudera@quickstart:~
File  Edit  View  Search  Terminal  Help
[cloudera@quickstart ~]$ hadoop fs -cat /data/card_transactions.csv | wc -l
53292
[cloudera@quickstart ~]$
```

total no of records

Move data from HDFS to Sqoop using sqoop export:

Now, we will try to export the HDFS file (card_transactions.csv) to newly created MySQL table **card_transactions** using **`Sqoop export`**.

```
sqoop export \
--connect jdbc:mysql://quickstart.cloudera:3306/banking \
--username root \
--password cloudera \
--table card_transactions \
--export-dir /data/card_transactions.csv \
--fields-terminated-by ','
```

Note: The Job will fail

The *card_transactions* table data shoud look like below:

```
cloudera@quickstart:~
File  Edit  View  Search  Terminal  Help
| 6478888441720966 | 273246841077378 | 3094329 |    59043 | 885476654650050 | 25-12-2016 07:08:31 | GENUINE |
| 6478888441720966 | 273246841077378 | 7937580 |    18254 | 691255588719240 | 26-01-2017 11:36:19 | GENUINE |
| 6478888441720966 | 273246841077378 | 6317165 |    25685 | 276217887671106 | 26-03-2017 14:07:43 | GENUINE |
| 6478888441720966 | 273246841077378 | 3868955 |    59758 |  32934628245497 | 26-09-2017 13:27:30 | GENUINE |
| 6478888441720966 | 273246841077378 | 6127519 |    39040 | 104442873565255 | 27-03-2017 16:27:45 | GENUINE |
| 6478888441720966 | 273246841077378 | 8853112 |    31782 | 394565472842075 | 27-06-2017 13:29:39 | GENUINE |
| 6478888441720966 | 273246841077378 | 8118813 |    39361 | 537355573005274 | 27-10-2017 17:20:36 | GENUINE |
| 6478888441720966 | 273246841077378 | 4342111 |    57766 | 499153824060670 | 28-01-2018 04:25:10 | GENUINE |
| 6478888441720966 | 273246841077378 | 8464524 |    36420 | 497898769747957 | 28-08-2017 15:59:49 | GENUINE |
| 6478888441720966 | 273246841077378 | 6618273 |    17772 | 708575154329682 | 28-10-2016 13:58:29 | GENUINE |
| 6478888441720966 | 273246841077378 | 7857927 |    80863 | 554649332037371 | 28-10-2017 12:39:17 | GENUINE |
| 6478888441720966 | 273246841077378 | 1438636 |    82431 | 360359919733360 | 29-06-2017 16:24:23 | GENUINE |
| 6478888441720966 | 273246841077378 | 6114961 |    64078 | 359729828861623 | 30-03-2017 19:57:12 | GENUINE |
| 6478888441720966 | 273246841077378 | 7365055 |    40075 | 657752585733304 | 31-03-2017 20:31:54 | GENUINE |
| 6478888441720966 | 273246841077378 | 7158863 |    24563 |  44686270157711 | 31-05-2017 20:42:02 | GENUINE |
| 6478888441720966 | 273246841077378 | 9718094 |    31567 | 652954787139096 | 31-07-2017 01:33:29 | GENUINE |
| 6478888441720966 | 273246841077378 | 9154188 |    98350 | 557363801899838 | 31-10-2016 17:27:56 | GENUINE |
+------------------+-----------------+---------+----------+-----------------+---------------------+---------+
500 rows in set (0.00 sec)

mysql>
```

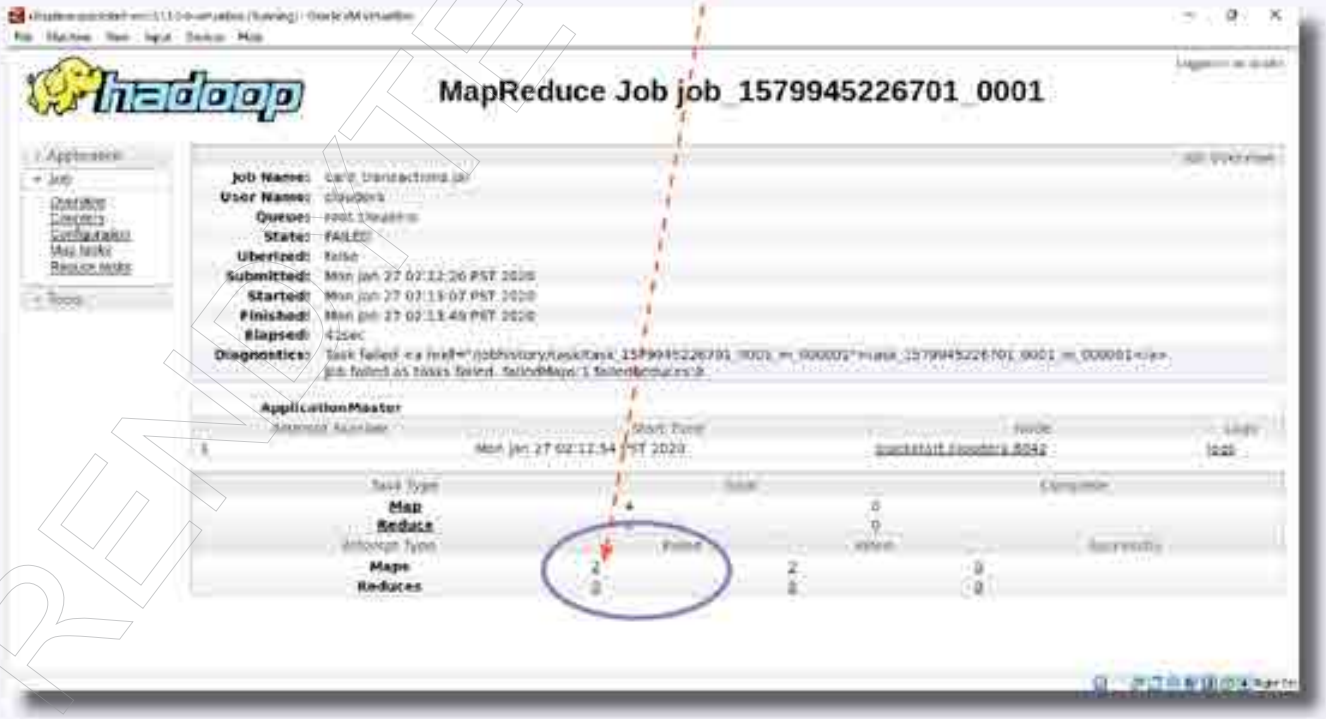
How to track the failed job:

- Go to the log and **find** The url to track the job
- **Copy** the given url

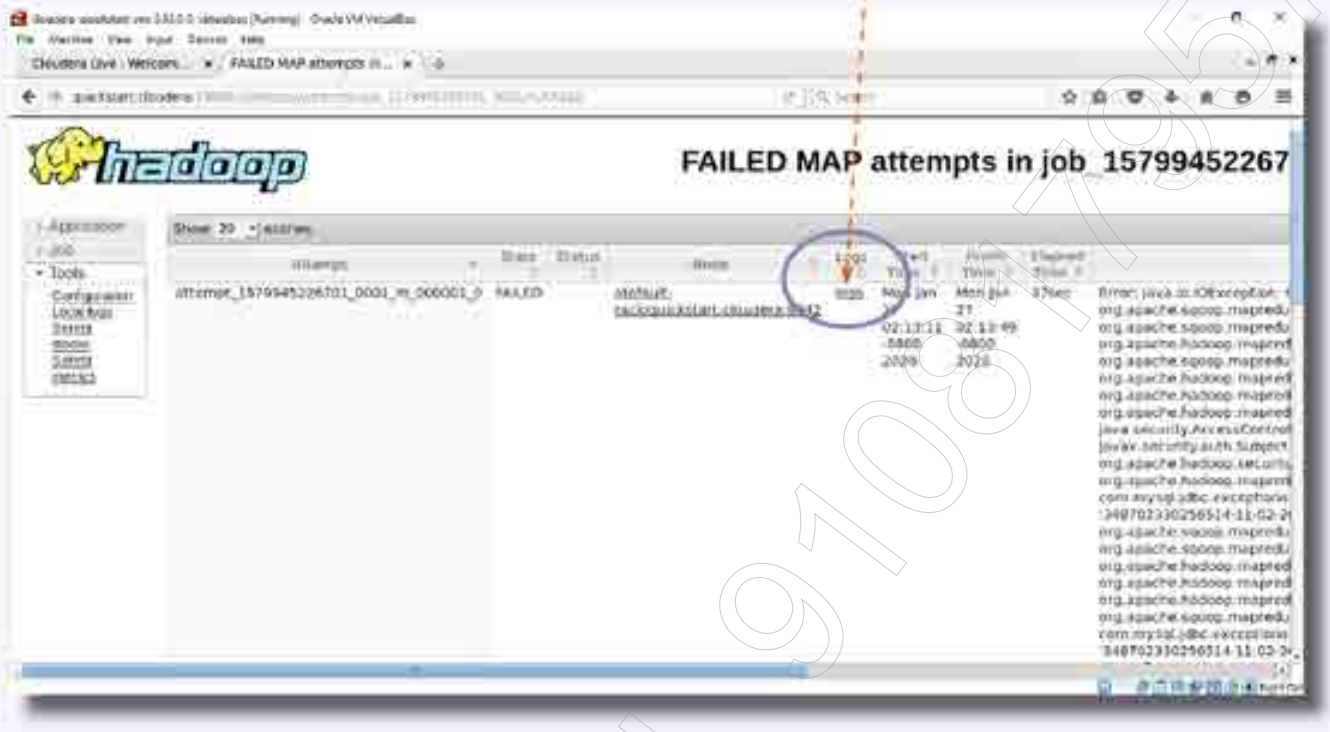
```
cloudera@quickstart:~
File  Edit  View  Search  Terminal  Help
20/01/27 02:12:18 INFO input.FileInputFormat: Total input paths to process : 1
20/01/27 02:12:18 INFO mapreduce.JobSubmitter: number of splits:4
20/01/27 02:12:19 INFO Configuration.deprecation: mapred.map.tasks.speculative.execution is depre
cated. Instead, use mapreduce.map.speculative
20/01/27 02:12:24 INFO mapreduce.JobSubmitter: Submitting tokens for job: job_1579945226701_0001
20/01/27 02:12:28 INFO impl.YarnClientImpl: Submitted application application_1579945226701_0001
20/01/27 02:12:28 INFO mapreduce.Job: The url to track the job: http://quickstart.cloudera:8088/p
roxy/application_1579945226701_0001/
20/01/27 02:12:28 INFO mapreduce.Job                    1579945226701_0001
20/01/27 02:13:09 INFO mapreduce.Job                    701_0001 running in uber mode : false
20/01/27 02:13:09 INFO mapreduce.Job
20/01/27 02:13:51 INFO mapreduce.Job
20/01/27 02:13:52 INFO mapreduce.Job                    %
20/01/27 02:13:53 INFO mapreduce.Job                    701_0001 failed with state FAILED due to:
 Task failed task_1579945226701_0001
Job failed as tasks failed. failedMa

Open Terminal
Open Tab
Close Window
Copy
Paste
Profiles
Show Menubar
```

- Go to the web browser and **paste** the url and enter

- Job history will show all details - **click** the hyperlink under failed



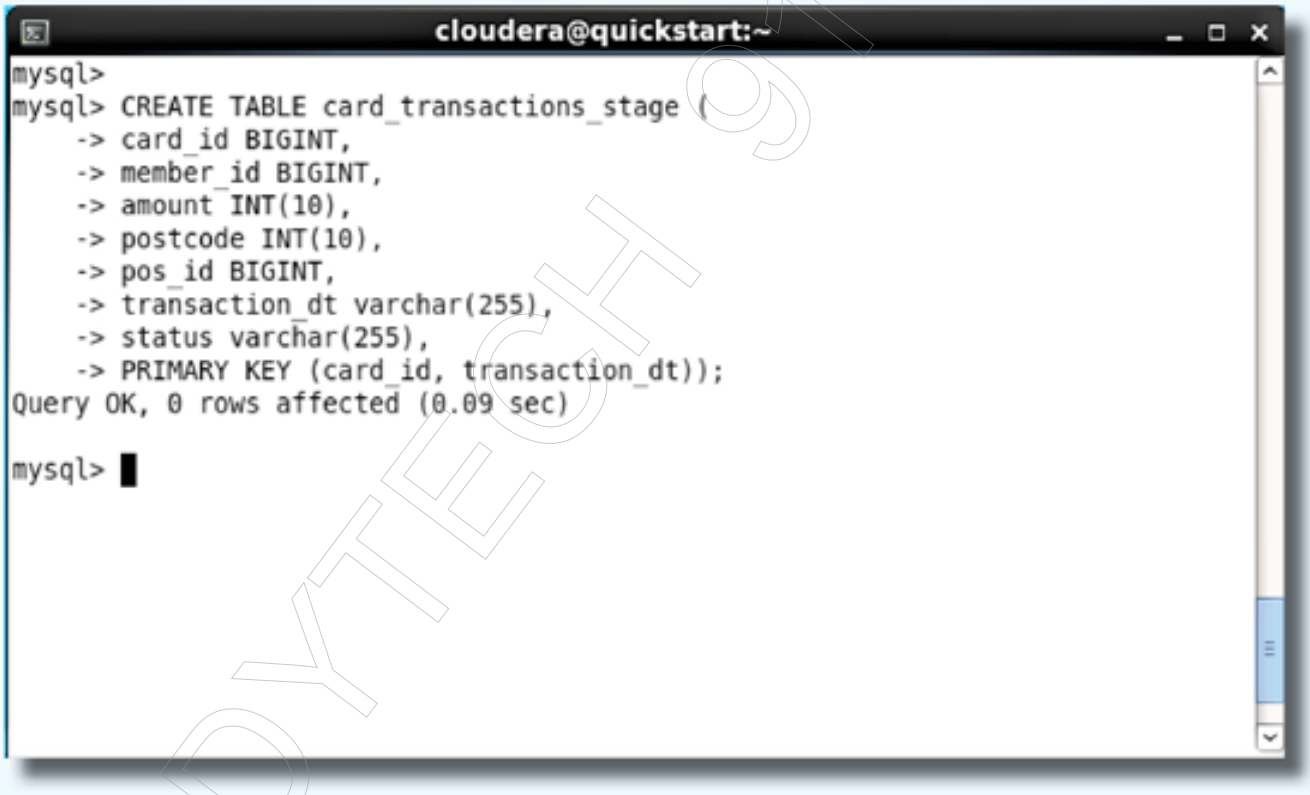
- In the FAILED MAP attempts window - **click** on logs under logs



- In the Log window, you will find the actual **errors**

Create a staging table *card_transactions_stage* in mysql:

```
CREATE TABLE card_transactions_stage (
card_id BIGINT,
member_id BIGINT,
amount INT(10),
postcode INT(10),
pos_id BIGINT,
transaction_dt varchar(255),
status varchar(255),
PRIMARY KEY (card_id, transaction_dt));
```



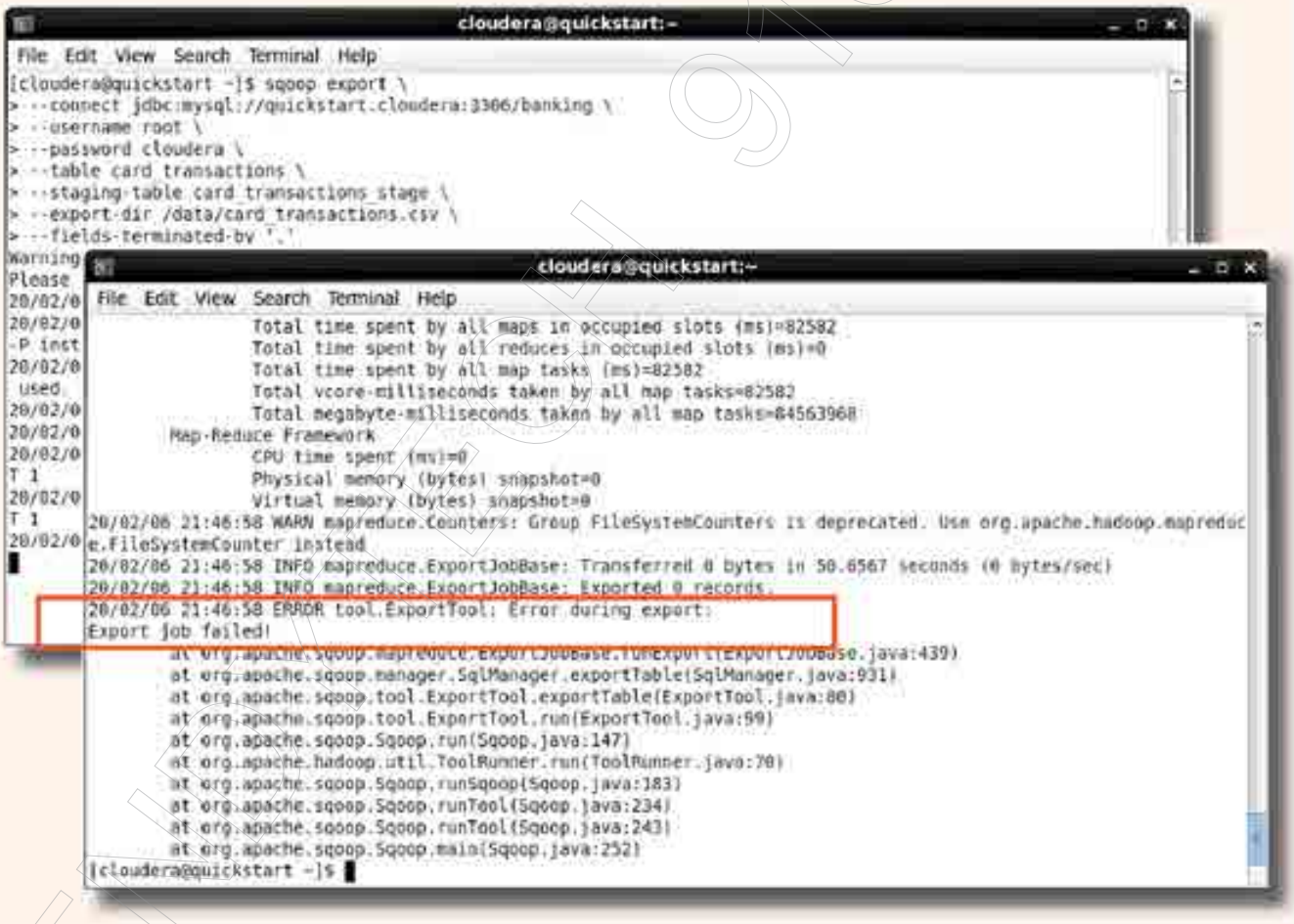
Truncate *card_transactions* table from mysql:

```
truncate table card_transactions;
```

```
cloudera@quickstart:~
mysql> show tables;
+-------------------------+
| Tables_in_banking       |
+-------------------------+
| card_transactions       |
| card_transactions_stage |
+-------------------------+
2 rows in set (0.00 sec)

mysql> truncate table card_transactions;
Query OK, 0 rows affected (0.03 sec)

mysql>
```

Export data from hdfs to mysql using staging table:

```
sqoop export \
--connect jdbc:mysql://quickstart.cloudera:3306/banking \
--username root \
--password cloudera \
--table card_transactions \
--staging-table card_transactions_stage \
--export-dir /data/card_transactions.csv \
--fields-terminated-by ','
```



Drop both the staging and the actual table from mysql:

```
drop table card_transactions;
```

```
cloudera@quickstart:~
File  Edit  View  Search  Terminal  Help
mysql> show tables;
+-------------------------+
| Tables_in_banking       |
+-------------------------+
| card_transactions       |
| card_transactions_stage |
+-------------------------+
2 rows in set (0.00 sec)

mysql> drop table card_transactions;
Query OK, 0 rows affected (0.03 sec)

mysql>
```

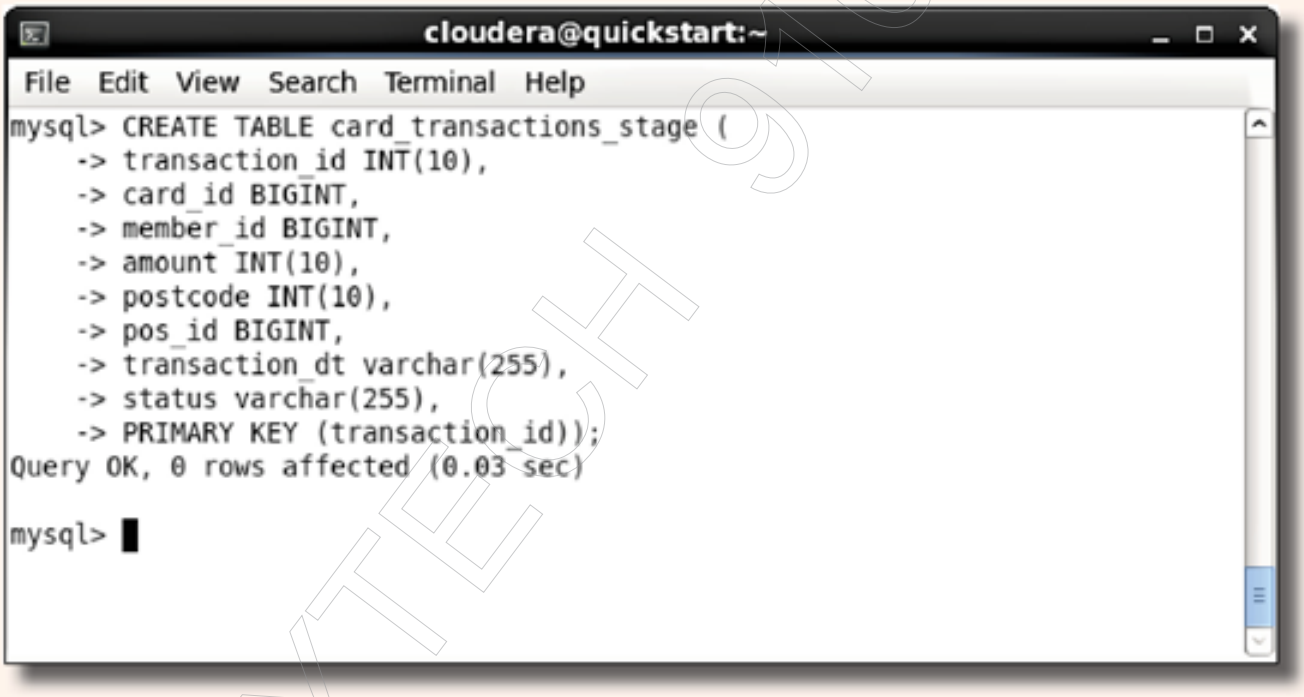
```
drop table card_transactions_stage;
```

```
cloudera@quickstart:~
File  Edit  View  Search  Terminal  Help
mysql> show tables;
+-------------------------+
| Tables_in_banking       |
+-------------------------+
| card_transactions_stage |
+-------------------------+
1 row in set (0.00 sec)

mysql> drop table card_transactions_stage;
Query OK, 0 rows affected (0.01 sec)

mysql>
```

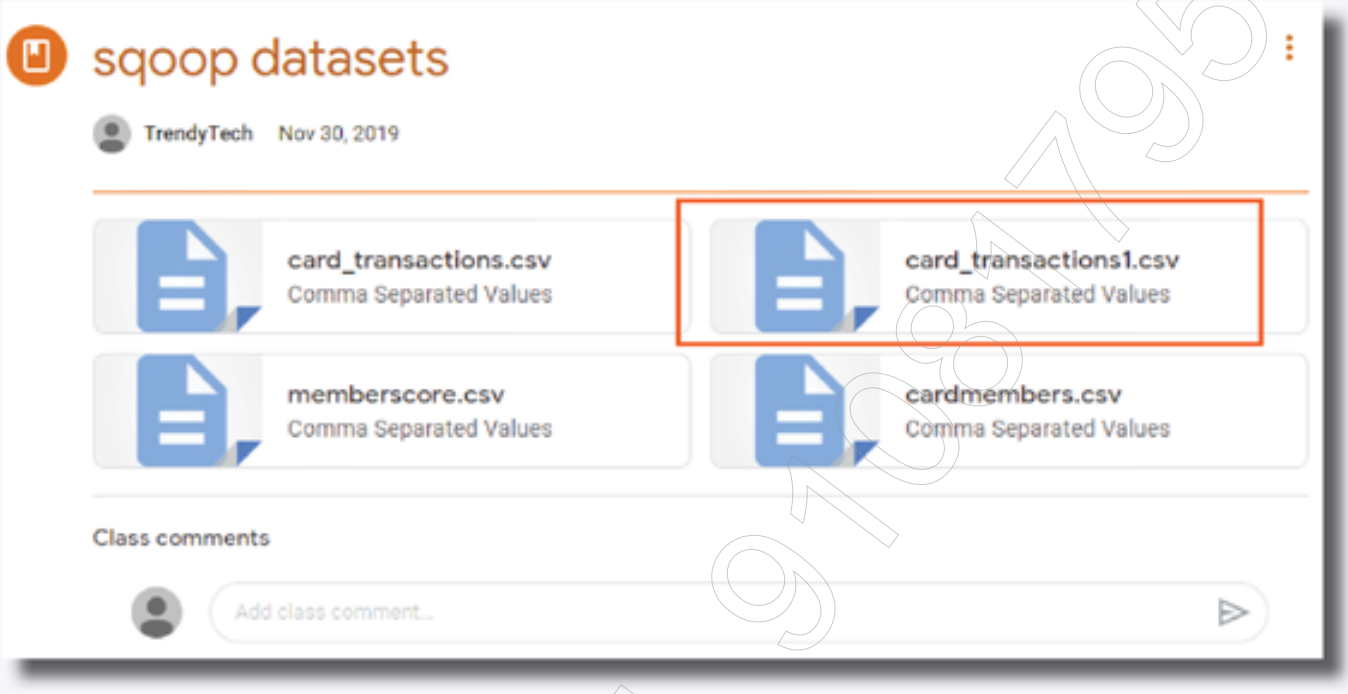
Create again same two (*card_transactions* & *card_transactions_stage*) tables in banking database of MySQL:

```
CREATE TABLE card_transactions (
transaction_id INT(10),
card_id BIGINT,
member_id BIGINT,
amount INT(10),
postcode INT(10),
pos_id BIGINT,
transaction_dt varchar(255),
status varchar(255),
PRIMARY KEY (transaction_id));
```

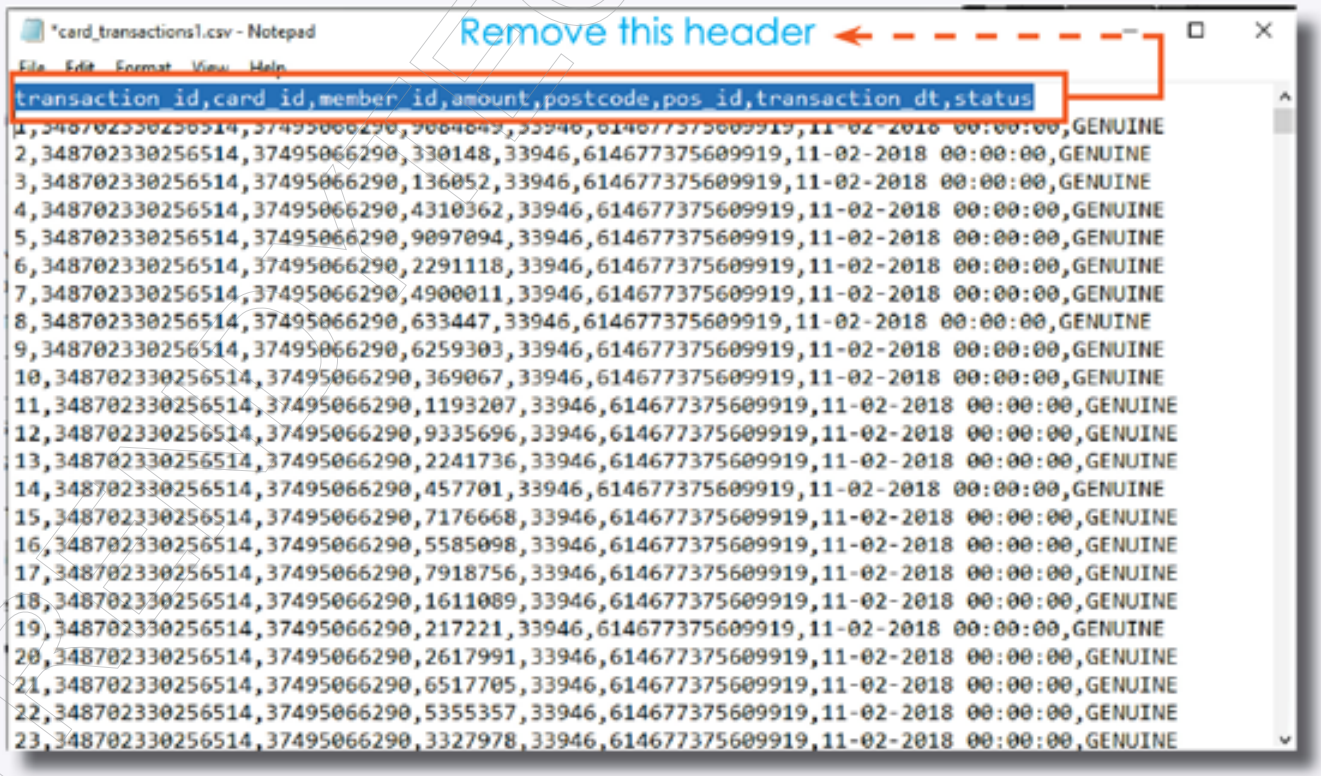
```
CREATE TABLE card_transactions_stage (
transaction_id INT(10),
card_id BIGINT,
member_id BIGINT,
amount INT(10),
postcode INT(10),
pos_id BIGINT,
transaction_dt varchar(255),
status varchar(255),
PRIMARY KEY (transaction_id));
```



Go to Google classroom and download the *card_transactions1.csv*:



Remove the header from the *card_transactions1.csv* file and save:



Move the *card_transactions1.csv* file to the HDFS *data* directory:

```
hadoop fs -put file:///home/cloudera/Downloads/card_
transactions1.csv /data/
```

```
cloudera@quickstart:~
File  Edit  View  Search  Terminal  Help
[cloudera@quickstart ~]$ hadoop fs -put file:///home/cloudera/Downloads/card_
transactions1.csv /data/
[cloudera@quickstart ~]$
[cloudera@quickstart ~]$ hadoop fs -ls /data/
Found 2 items
-rw-r--r--   1 cloudera supergroup    4829457 2020-01-27 01:34 /data/card_tra
nsactions.csv
-rw-r--r--   1 cloudera supergroup    5179987 2020-02-07 00:37 /data/card_tra
nsactions1.csv
[cloudera@quickstart ~]$
```

The *card_transactions* tabele data shoud look like below:

```
cloudera@quickstart:~
File  Edit  View  Search  Terminal  Help
[cloudera@quickstart ~]$ hadoop fs -cat /data/card_transactions1.csv | head
1,348702330256514,37495066290,9084849,33946,614677375609919,11-02-2018 00:00:00,GENUINE
2,348702330256514,37495066290,330148,33946,614677375609919,11-02-2018 00:00:00,GENUINE
3,348702330256514,37495066290,136052,33946,614677375609919,11-02-2018 00:00:00,GENUINE
4,348702330256514,37495066290,4310362,33946,614677375609919,11-02-2018 00:00:00,GENUINE
5,348702330256514,37495066290,9097094,33946,614677375609919,11-02-2018 00:00:00,GENUINE
6,348702330256514,37495066290,2291118,33946,614677375609919,11-02-2018 00:00:00,GENUINE
7,348702330256514,37495066290,4900011,33946,614677375609919,11-02-2018 00:00:00,GENUINE
8,348702330256514,37495066290,633447,33946,614677375609919,11-02-2018 00:00:00,GENUINE
9,348702330256514,37495066290,6259303,33946,614677375609919,11-02-2018 00:00:00,GENUINE
10,348702330256514,37495066290,369067,33946,614677375609919,11-02-2018 00:00:00,GENUINE
cat: Unable to write to output stream.
[cloudera@quickstart ~]$
```

Now export the *card_transactions1.csv* from hdfs to mysql through staging table:

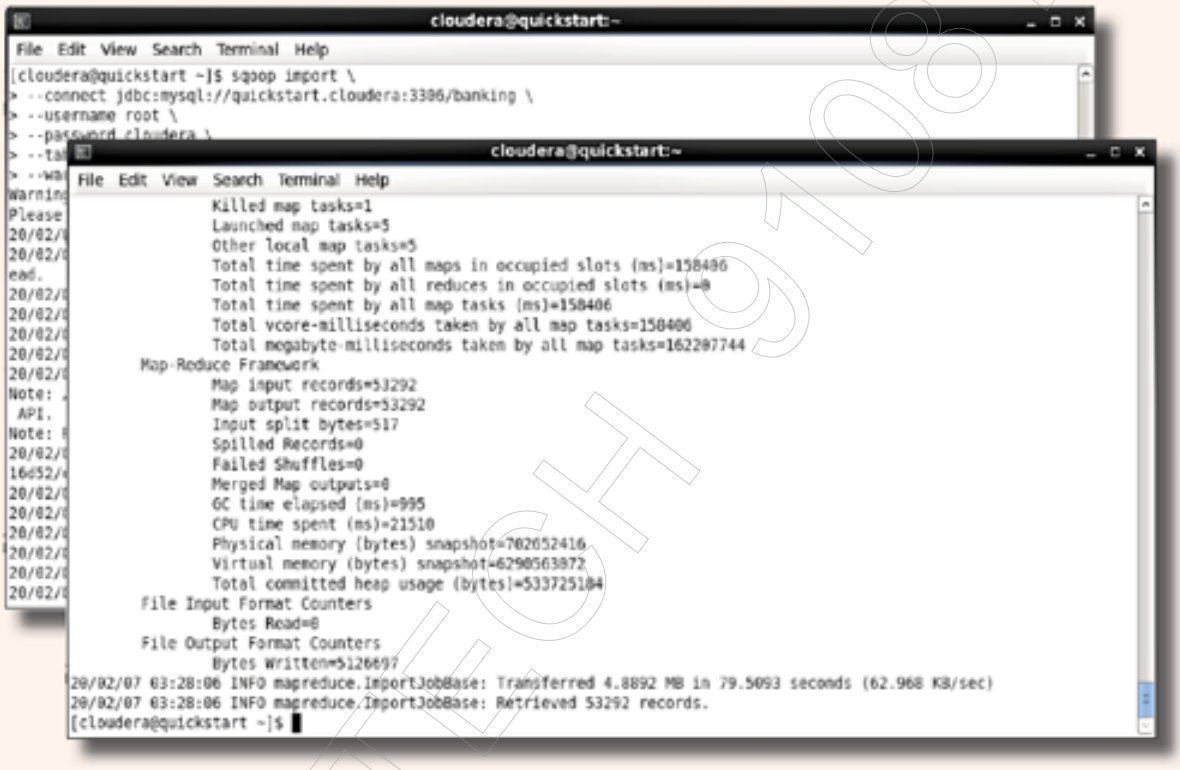
```
sqoop export \
--connect jdbc:mysql://quickstart.cloudera:3306/banking \
--username root \
--password cloudera \
--table card_transactions \
--staging-table card_transactions_stage \
--export-dir /data/card_transactions1.csv \
--fields-terminated-by ','
```

```
cloudera@quickstart:~
File  Edit  View  Search  Terminal  Help
[cloudera@quickstart ~]$ sqoop export \
> --connect jdbc:mysql://quickstart.cloudera:3306/banking \
> --username root \
> --password cloudera \
> --table card_transactions \
> --staging-table card_transactions_stage \
> --export-dir /data/card_transactions1.csv \
> --fields-terminated-by ','
```

```
cloudera@quickstart:~
File  Edit  View  Search  Terminal  Help
                Data-local map tasks=4
                Total time spent by all maps in occupied slots (ms)=103947
                Total time spent by all reduces in occupied slots (ms)=0
                Total time spent by all map tasks (ms)=103947
                Total vcore-milliseconds taken by all map tasks=103947
                Total megabyte-milliseconds taken by all map tasks=106441728
        Map-Reduce Framework
                Map input records=53292
                Map output records=53292
                Input split bytes=636
                Spilled Records=0
                Failed Shuffles=0
                Merged Map outputs=0
                GC time elapsed (ms)=650
                CPU time spent (ms)=15950
                Physical memory (bytes) snapshot=729100288
                Virtual memory (bytes) snapshot=6259118080
                Total committed heap usage (bytes)=525860864
        File Input Format Counters
                Bytes Read=0
        File Output Format Counters
                Bytes Written=0
20/02/07 02:57:28 INFO mapreduce.ExportJobBase: Transferred 4.9563 MB in 69.1503 seconds (73.394 KB/sec)
20/02/07 02:57:28 INFO mapreduce.ExportJobBase: Exported 53292 records.
20/02/07 02:57:28 INFO mapreduce.ExportJobBase: Starting to migrate data from staging table to destination.
20/02/07 02:57:29 INFO manager.SqlManager: Migrated 53292 records from `card_transactions_stage` to `card_transactions`
[cloudera@quickstart ~]$
```

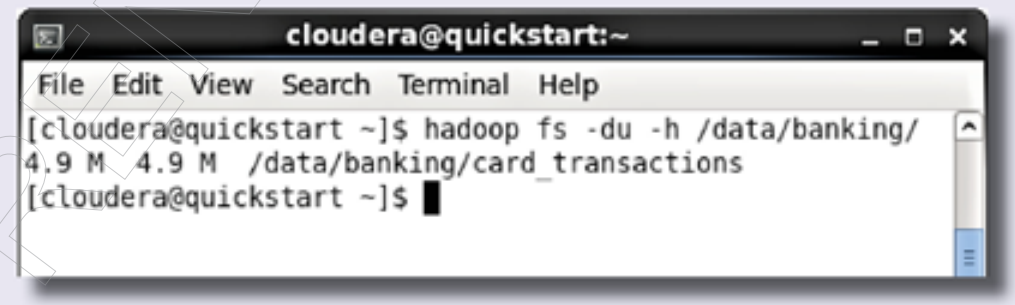
Import back the *card_transactions1.csv* from mysql to hdfs:

```
sqoop import \
--connect jdbc:mysql://quickstart.cloudera:3306/banking \
--username root --password cloudera \
--table card_transactions \
--warehouse-dir /data/banking
```



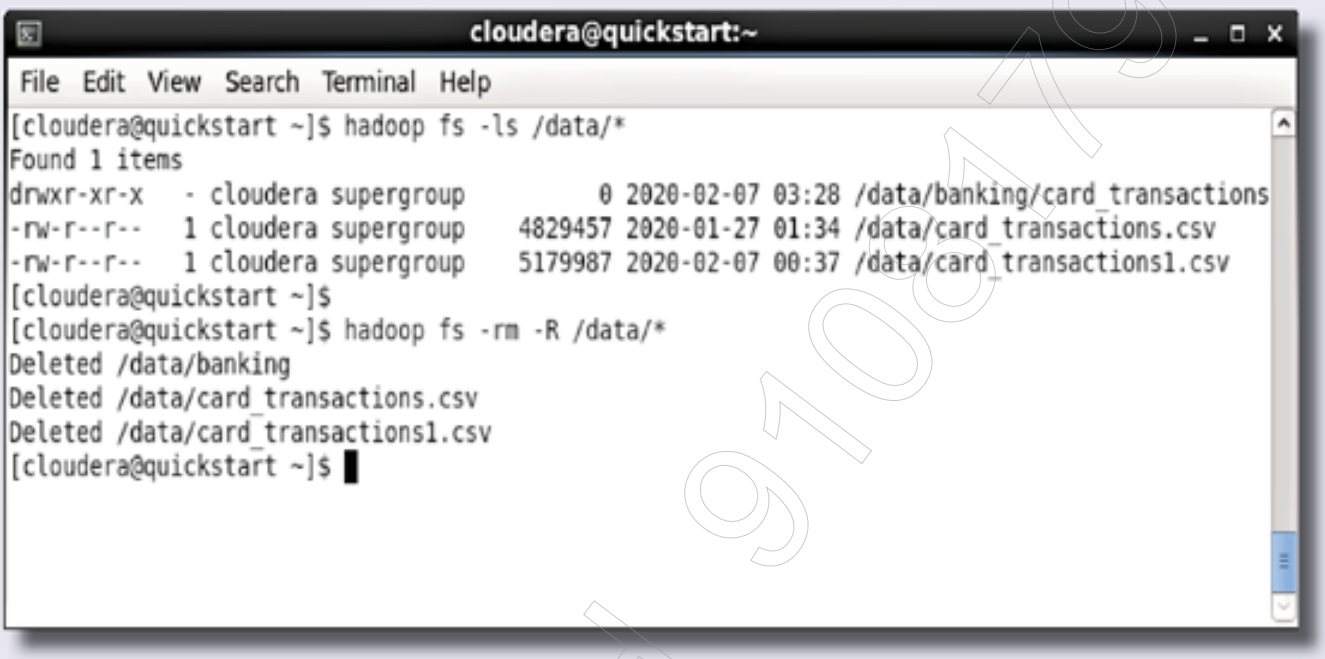
To check the size of the imported data:

```
hadoop fs -du -h /data/banking/
```



Command to delete directories from hdfs:

```
hadoop fs -rm -R /data/*
```



Import data from mysql to hdfs in compress form:

```
sqoop import \
--connect jdbc:mysql://quickstart.cloudera:3306/banking \
--username root \
--password cloudera \
--table card_transactions \
--warehouse-dir /data/banking \
--compress
```

Check again the size of the imported data in compress form:

```
hadoop fs -du -h /data/banking/
```

Sqoop Incremental

Create a table in mysql under banking database:

```
create table member_details(
card_id BIGINT,
member_id BIGINT,
member_joining_dt timestamp,
card_purchase_dt varchar(255),
country varchar(255),
city varchar(255),
PRIMARY KEY (card_id));
```

Create a staging table in mysql under banking database:

```
create table member_details_stage as
select * from member_details where 1=0;
```

Create a directory in hdfs and put the *cardmembers.csv* data in it:

```
hadoop fs -mkdir /data/banking/card_member
```

```
hadoop fs -put file:///home/cloudera/Downloads/
cardmembers.csv /data/banking/card_member/
```

Export the data to the created table (*member_details*) in mysql through staging table of banking database from hdfs:

```
sqoop export \
--connect jdbc:mysql://quickstart.cloudera:3306/banking \
--username root \
--password cloudera \
--table member_details \
--staging-table member_details_stage \
--export-dir /data/banking/card_member \
--fields-terminated-by ','
```

Create a Sqoop job to import data from mysql to hdfs:

```
sqoop job \
--create job_banking_member_details \
--import \
--connect jdbc:mysql://quickstart.cloudera:3306/banking \
--username root \
--password cloudera \
--table member_details \
--warehouse-dir /data/banking \
--incremental append \
--check-column card_id \
--last-value 0
```

List available Sqoop jobs:

```
sqoop job --list
```

Execute a Sqoop job:

```
sqoop job --exec job_banking_member_details
```

To show last incremental parameter:

```
sqoop job --show job_banking_member_details | grep
incremental
```

Delete a Sqoop job:

```
sqoop job --delete job_banking_member_details
```

To create a password file:

```
echo -n "cloudera" >> password-file
```

Create a Sqoop job with password file:

```
sqoop job \
--create job_banking_member_details \
-- import \
--connect jdbc:mysql://quickstart.cloudera:3306/banking \
--username root \
--password-file file:///home/cloudera/password-file \
--table member_details \
--warehouse-dir /data/banking \
--incremental append \
--check-column card_id \
--last-value 0
```

Execute a Sqoop job:

```
sqoop job --exec job_banking_member_details
```

To check the output files:

```
hadoop fs -cat /data/banking/member_score/* | wc -l
```

```
CREATE TABLE member_score(
member_id BIGINT,
score INT(3),
PRIMARY KEY (member_id));
```

```
CREATE TABLE member_score_stage(
member_id BIGINT,
score INT(3),
PRIMARY KEY (member_id));
```

```
sqoop export \
--connect jdbc:mysql://quickstart.cloudera:3306/banking \
--username root \
--password cloudera \
--table member_score \
--staging-table member_score_stage \
--export-dir /data/banking/member_score \
--fields-terminated-by ','
```

```
sqoop import \
--connect jdbc:mysql://quickstart.cloudera:3306/banking \
--username root \
--password cloudera \
--table member_score \
--delete-target-dir \
--warehouse-dir /data/banking
```

java cryptography encryption key store

reference link: https://www.ericlin.me/2015/06/securely-managing-passwords-in-sqoop/

https://www.pixelstech.net/article/1420439432-Different-types-of-keystore-in-Java----JCEKS

```
hadoop credential create mysql.banking.password -provider
jceks://hdfs/user/sumitm/mysql.password.jceks
```

```
hadoop fs -cat /user/sumitm/mysql.password.jceks
```

```
sqoop eval \
-Dhadoop.security.credential.provider.path=jceks://hdfs/
user/sumitm/mysql.password.jceks \
--connect jdbc:mysql://quickstart.cloudera:3306/banking \
--username root \
--password-alias mysql.banking.password \
--query "select count(1) from member_score"
```

```
sqoop import \
--connect jdbc:mysql://quickstart.cloudera:3306/banking \
--username root \
--password cloudera \
--table card_transactions \
--hive-import \
--hive-database banking \
--compress
```

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