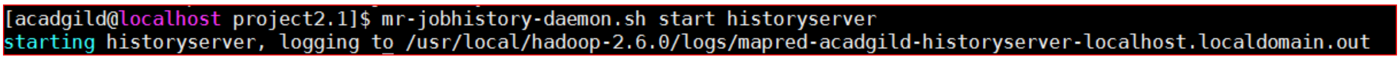
*****Problem Statement 4*****

PIG: Write a pig script to find no of complaints filed with product type has " Debt collection" for the year 2015

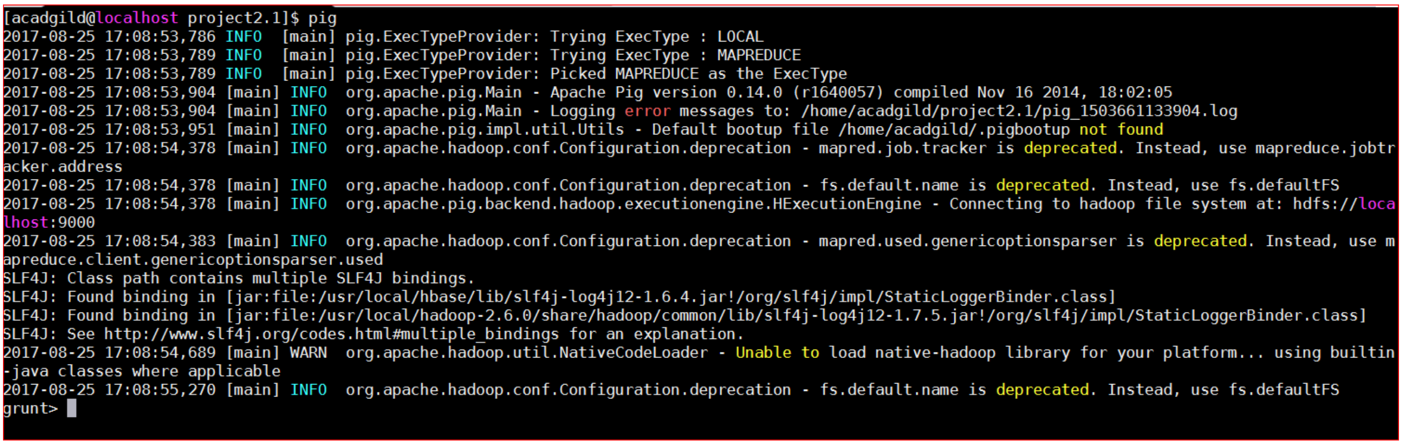
Step 1: Start pig in mapreduce mode.

$ mr-jobhistory-daemon.sh start historyserver

$ pig



```
[acadgild@localhost project2.1]$ mr-jobhistory-daemon.sh start historyserver
starting historyserver, logging to /usr/local/hadoop-2.6.0/logs/mapred-acadgild-historyserver-localhost.localdomain.out
```

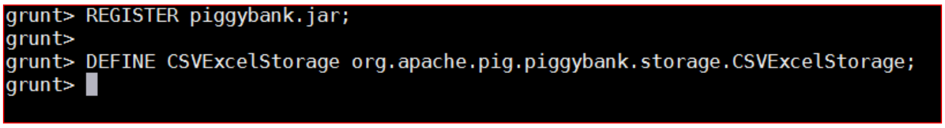


```
[acadgild@localhost project2.1]$ pig
2017-08-25 17:08:53,786 INFO  [main] pig.ExecTypeProvider: Trying ExecType : LOCAL
2017-08-25 17:08:53,789 INFO  [main] pig.ExecTypeProvider: Trying ExecType : MAPREDUCE
2017-08-25 17:08:53,789 INFO  [main] pig.ExecTypeProvider: Picked MAPREDUCE as the ExecType
2017-08-25 17:08:53,904 [main] INFO  org.apache.pig.Main - Apache Pig version 0.14.0 (r1640057) compiled Nov 16 2014, 18:02:05
2017-08-25 17:08:53,904 [main] INFO  org.apache.pig.Main - Logging error messages to: /home/acadgild/project2.1/pig_1503661133904.log
2017-08-25 17:08:53,951 [main] INFO  org.apache.pig.impl.util.Utils - Default bootup file /home/acadgild/.pigbootup not found
2017-08-25 17:08:54,378 [main] INFO  org.apache.hadoop.conf.Configuration.deprecation - mapred.job.tracker is deprecated. Instead, use mapreduce.jobtr
acker.address
2017-08-25 17:08:54,378 [main] INFO  org.apache.hadoop.conf.Configuration.deprecation - fs.default.name is deprecated. Instead, use fs.defaultFS
2017-08-25 17:08:54,378 [main] INFO  org.apache.pig.backend.hadoop.executionengine.HExecutionEngine - Connecting to hadoop file system at: hdfs://loca
lhost:9000
2017-08-25 17:08:54,383 [main] INFO  org.apache.hadoop.conf.Configuration.deprecation - mapred.used.genericoptionsparser is deprecated. Instead, use m
apreduce.client.genericoptionsparser.used
SLF4J: Class path contains multiple SLF4J bindings.
SLF4J: Found binding in [jar:file:/usr/local/hbase/lib/slf4j-log4j12-1.6.4.jar!/org/slf4j/impl/StaticLoggerBinder.class]
SLF4J: Found binding in [jar:file:/usr/local/hadoop-2.6.0/share/hadoop/common/lib/slf4j-log4j12-1.7.5.jar!/org/slf4j/impl/StaticLoggerBinder.class]
SLF4J: See http://www.slf4j.org/codes.html#multiple_bindings for an explanation.
2017-08-25 17:08:54,689 [main] WARN  org.apache.hadoop.util.NativeCodeLoader - Unable to load native-hadoop library for your platform... using builtin
-java classes where applicable
2017-08-25 17:08:55,270 [main] INFO  org.apache.hadoop.conf.Configuration.deprecation - fs.default.name is deprecated. Instead, use fs.defaultFS
grunt>
```

Step 2: register piggybank.jar:

REGISTER piggybank.jar;

DEFINE CSVExcelStorage org.apache.pig.piggybank.storage.CSVExcelStorage;



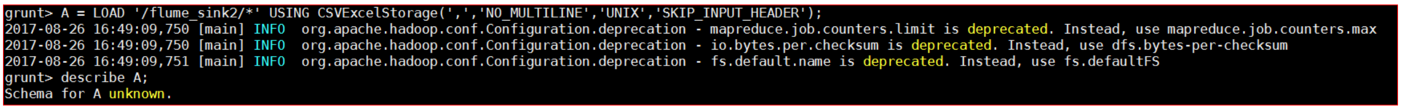
```
grunt> REGISTER piggybank.jar;
grunt>
grunt> DEFINE CSVExcelStorage org.apache.pig.piggybank.storage.CSVExcelStorage;
grunt>
```

CSVExcelStorage will be used to load CSV file into pig relation.

Step 3: Load file into relation:

A = LOAD '/flume_sink2/' USING CSVExcelStorage(',','NO_MULTILINE','UNIX','SKIP_INPUT_HEADER');*

describe A;



```
grunt> A = LOAD '/flume_sink2/*' USING CSVExcelStorage(',','NO_MULTILINE','UNIX','SKIP_INPUT_HEADER');
2017-08-26 16:49:09,750 [main] INFO  org.apache.hadoop.conf.Configuration.deprecation - mapreduce.job.counters.limit is deprecated. Instead, use mapreduce.job.counters.max
2017-08-26 16:49:09,750 [main] INFO  org.apache.hadoop.conf.Configuration.deprecation - io.bytes.per.checksum is deprecated. Instead, use dfs.bytes-per-checksum
2017-08-26 16:49:09,751 [main] INFO  org.apache.hadoop.conf.Configuration.deprecation - fs.default.name is deprecated. Instead, use fs.defaultFS
grunt> describe A;
Schema for A unknown.
```

Relation 'A' has been loaded with CSV file along with below details:

Separator Character: ","

Multi line treatment of the record: *NO_MULTILINE*

Line Break Type: UNIX

Header of CSV: SKIP_INPUT_HEADER = this will ensure that header of the CSV will not be loaded into relation.

Step 4: Select the required columns from dataset:

Dataset Description

```
Below is the description of the data set

 Column heading              index  Description
 Date received               0      date on which consumer filed the
                                    complaint

 Product                     1      Type of the product
 Sub-product                 2      Sub product type
 Issue                       3      Issue faced by the consumer
 Sub-issue                   4      Any sub issues if exists
 Consumer complaint          5      Detailed description of complaint
 narrative
 Company public response     6      Company's public response to the
                                    complaint
 Company                     7      Name of the company
 State                       8      State from which consumer filed the
                                    complaint
 ZIP code                    9      Zip code
 Submitted via               10     Channel from which complaint was
                                    submitted

 Date sent to company        11     Date on which consumer forum forwarded
                                    the complaint to company

 Company response to         12     Company's  response to the consumer
 consumer
 Timely response?            13
 Consumer disputed?          14
 Complaint ID                15     Unique complaint id

This data is comma delimited.
```

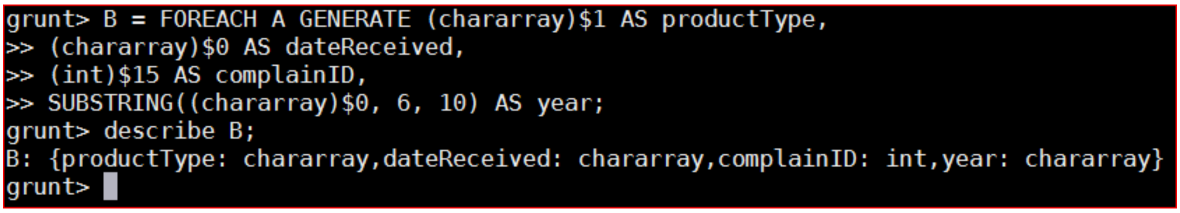
B = FOREACH A GENERATE (chararray)$1 AS productType,

(chararray)$0 AS dateReceived,

(int)$15 AS complainID,

SUBSTRING((chararray)$0, 6, 10) AS year;

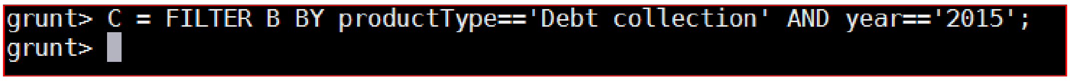
describe B;



```
grunt> B = FOREACH A GENERATE (chararray)$1 AS productType,
>> (chararray)$0 AS dateReceived,
>> (int)$15 AS complainID,
>> SUBSTRING((chararray)$0, 6, 10) AS year;
grunt> describe B;
B: {productType: chararray,dateReceived: chararray,complainID: int,year: chararray}
grunt> 
```

Step 5: Filter the relation based on year = 2015 and productType = Debt collection:

C = FILTER B BY productType=='Debt collection' AND year=='2015';

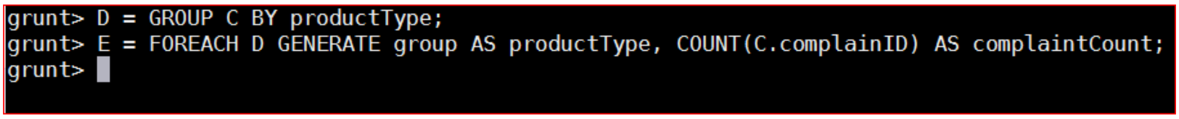


```
grunt> C = FILTER B BY productType=='Debt collection' AND year=='2015';
grunt> 
```

Step 6: Calculate the count of complains by grouping on productType:

D = GROUP C BY productType;

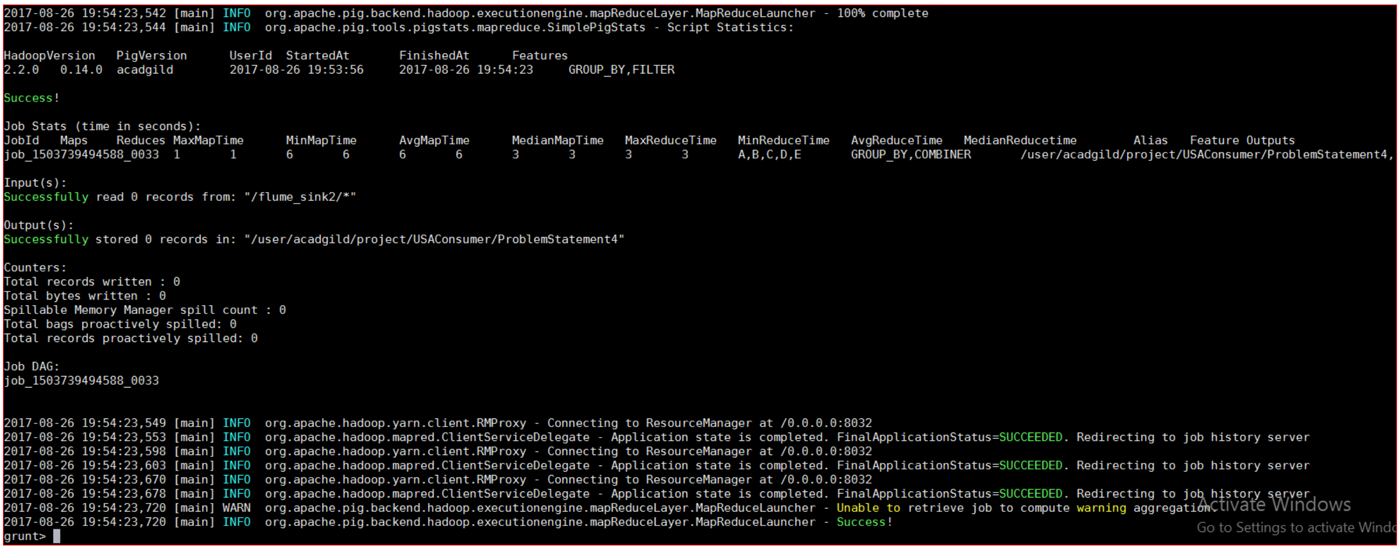
E = FOREACH D GENERATE group AS productType, COUNT(C.complainID) AS complaintCount;



```
grunt> D = GROUP C BY productType;
grunt> E = FOREACH D GENERATE group AS productType, COUNT(C.complainID) AS complaintCount;
grunt> 
```

Step 7: Store the result in '/user/acadgild/project/USAConsumer/ProblemStatement4' HDFS directory:

STORE E INTO '/user/acadgild/project/USAConsumer/ProblemStatement4';

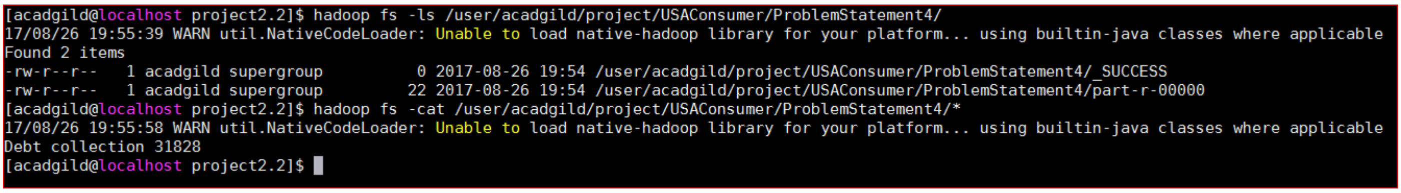


```
2017-08-26 19:54:23,542 [main] INFO  org.apache.pig.backend.hadoop.executionengine.mapReduceLayer.MapReduceLauncher - 100% complete
2017-08-26 19:54:23,544 [main] INFO  org.apache.pig.tools.pigstats.mapreduce.SimplePigStats - Script Statistics:

HadoopVersion   PigVersion      UserId  StartedAt       FinishedAt      Features
2.2.0   0.14.0  acadgild        2017-08-26 19:53:56     2017-08-26 19:54:23     GROUP_BY,FILTER

Success!

Job Stats (time in seconds):
JobId   Maps    Reduces MaxMapTime      MinMapTime      AvgMapTime      MedianMapTime   MaxReduceTime   MinReduceTime   AvgReduceTime   MedianReducetime        Alias   Feature Outputs
job_1503739494588_0033  1       1       6       6       6       6       3       3       3       3       A,B,C,D,E       GROUP_BY,COMBINER       /user/acadgild/project/USAConsumer/ProblemStatement4,

Input(s):
Successfully read 0 records from: "/flume_sink2/*"

Output(s):
Successfully stored 0 records in: "/user/acadgild/project/USAConsumer/ProblemStatement4"

Counters:
Total records written : 0
Total bytes written : 0
Spillable Memory Manager spill count : 0
Total bags proactively spilled: 0
Total records proactively spilled: 0

Job DAG:
job_1503739494588_0033


2017-08-26 19:54:23,549 [main] INFO  org.apache.hadoop.yarn.client.RMProxy - Connecting to ResourceManager at /0.0.0.0:8032
2017-08-26 19:54:23,553 [main] INFO  org.apache.hadoop.mapred.ClientServiceDelegate - Application state is completed. FinalApplicationStatus=SUCCEEDED. Redirecting to job history server
2017-08-26 19:54:23,598 [main] INFO  org.apache.hadoop.yarn.client.RMProxy - Connecting to ResourceManager at /0.0.0.0:8032
2017-08-26 19:54:23,603 [main] INFO  org.apache.hadoop.mapred.ClientServiceDelegate - Application state is completed. FinalApplicationStatus=SUCCEEDED. Redirecting to job history server
2017-08-26 19:54:23,670 [main] INFO  org.apache.hadoop.yarn.client.RMProxy - Connecting to ResourceManager at /0.0.0.0:8032
2017-08-26 19:54:23,678 [main] INFO  org.apache.hadoop.mapred.ClientServiceDelegate - Application state is completed. FinalApplicationStatus=SUCCEEDED. Redirecting to job history server
2017-08-26 19:54:23,720 [main] WARN  org.apache.pig.backend.hadoop.executionengine.mapReduceLayer.MapReduceLauncher - Unable to retrieve job to compute warning aggregation.
2017-08-26 19:54:23,720 [main] INFO  org.apache.pig.backend.hadoop.executionengine.mapReduceLayer.MapReduceLauncher - Success!
grunt> 
```

Step 8: Check the content in HDFS directory:

$ hadoop fs -ls /user/acadgild/project/USAConsumer/ProblemStatement4/

*$ hadoop fs -cat /user/acadgild/project/USAConsumer/ProblemStatement4/**



```
[acadgild@localhost project2.2]$ hadoop fs -ls /user/acadgild/project/USAConsumer/ProblemStatement4/
17/08/26 19:55:39 WARN util.NativeCodeLoader: Unable to load native-hadoop library for your platform... using builtin-java classes where applicable
Found 2 items
-rw-r--r--   1 acadgild supergroup          0 2017-08-26 19:54 /user/acadgild/project/USAConsumer/ProblemStatement4/_SUCCESS
-rw-r--r--   1 acadgild supergroup         22 2017-08-26 19:54 /user/acadgild/project/USAConsumer/ProblemStatement4/part-r-00000
[acadgild@localhost project2.2]$ hadoop fs -cat /user/acadgild/project/USAConsumer/ProblemStatement4/*
17/08/26 19:55:58 WARN util.NativeCodeLoader: Unable to load native-hadoop library for your platform... using builtin-java classes where applicable
Debt collection 31828
[acadgild@localhost project2.2]$ 
```

PIG output have been stored successfully with the data separated by TAB (\t) which shows productType and Count of complaints which are associated with productType ‘Debt collection’.

PIG script is save with name ProblemStatement4.PIG which can be run using below command:

$ pig <filepath>/ProblemStatement4.PIG

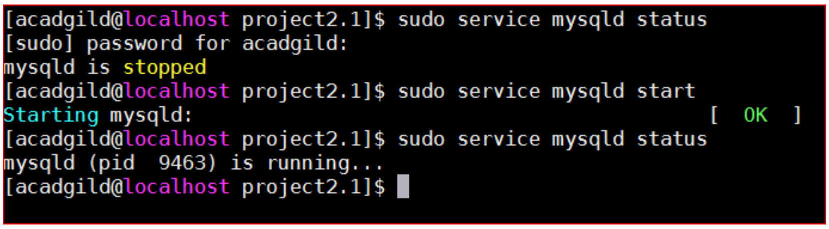
SQOOP: Export the results to mysql.

Step 1: start mysql/services:

$ sudo service mysqld status

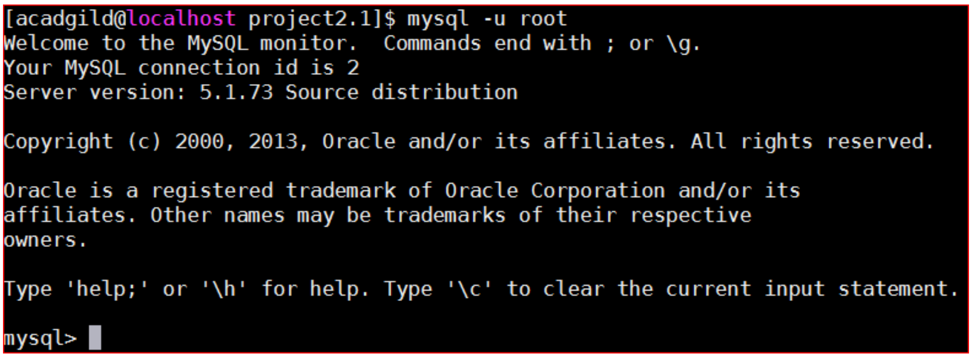
$ sudo service mysqld start

$ sudo service mysqld status



```
[acadgild@localhost project2.1]$ sudo service mysqld status
[sudo] password for acadgild:
mysqld is stopped
[acadgild@localhost project2.1]$ sudo service mysqld start
Starting mysqld:                                           [  OK  ]
[acadgild@localhost project2.1]$ sudo service mysqld status
mysqld (pid  9463) is running...
[acadgild@localhost project2.1]$ 
```

$ mysql -u root



```
[acadgild@localhost project2.1]$ mysql -u root
Welcome to the MySQL monitor.  Commands end with ; or \g.
Your MySQL connection id is 2
Server version: 5.1.73 Source distribution

Copyright (c) 2000, 2013, Oracle and/or its affiliates. All rights reserved.

Oracle is a registered trademark of Oracle Corporation and/or its
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> 
```

Above command launches mysql with user root.

Step2: create table DebtCollectionCount column productType & complaintCount:

use db1;

show tables;

create table DebtCollectionCount

(

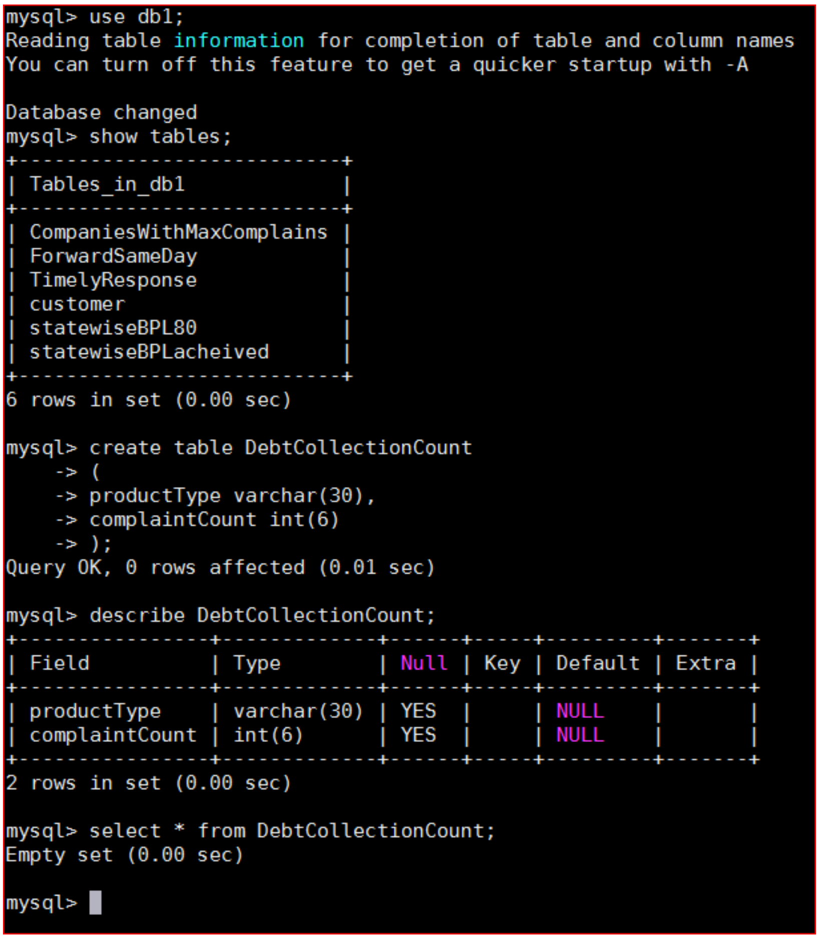
productType varchar(30),

complaintCount int(6)

);

describe DebtCollectionCount;

*select * from DebtCollectionCount;*



```
mysql> use db1;
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_db1            |
+--------------------------+
| CompaniesWithMaxComplains |
| ForwardSameDay           |
| TimelyResponse           |
| customer                 |
| statewiseBPL80           |
| statewiseBPLacheived     |
+--------------------------+
6 rows in set (0.00 sec)

mysql> create table DebtCollectionCount
    -> (
    -> productType varchar(30),
    -> complaintCount int(6)
    -> );
Query OK, 0 rows affected (0.01 sec)

mysql> describe DebtCollectionCount;
+----------------+-------------+------+-----+---------+-------+
| Field          | Type        | Null | Key | Default | Extra |
+----------------+-------------+------+-----+---------+-------+
| productType    | varchar(30) | YES  |     | NULL    |       |
| complaintCount | int(6)      | YES  |     | NULL    |       |
+----------------+-------------+------+-----+---------+-------+
2 rows in set (0.00 sec)

mysql> select * from DebtCollectionCount;
Empty set (0.00 sec)

mysql> █
```

Step 3: run sqoop export command to get data from output directory of the pig job to mysql table.

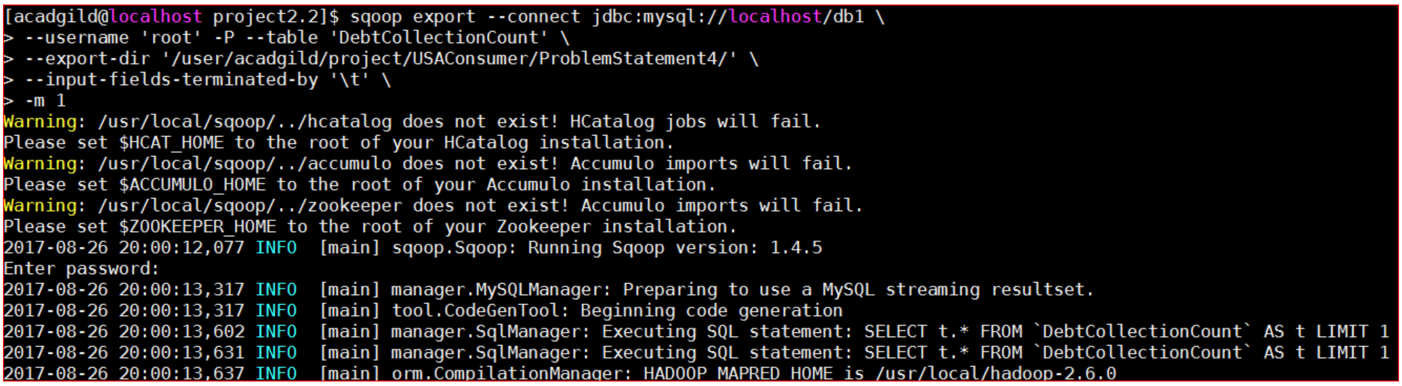
*sqoop export --connect jdbc:mysql://localhost/db1 *

*--username 'root' -P --table 'DebtCollectionCount' *

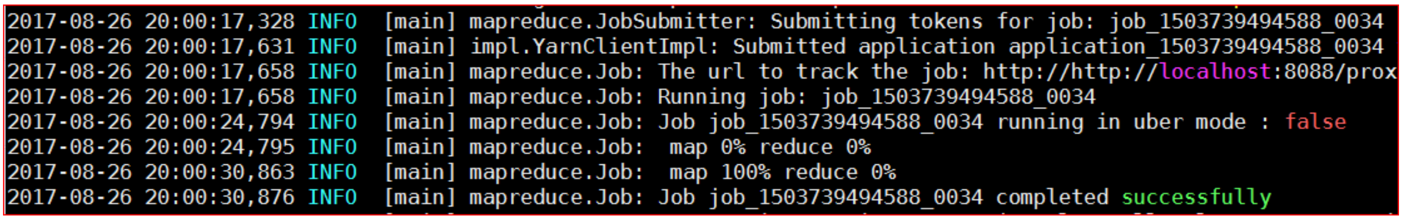
*--export-dir '/user/acadgild/project/USAConsumer/ProblemStatement4/' *

*--input-fields-terminated-by '\t' *

-m 1



```
[acadgild@localhost project2.2]$ sqoop export --connect jdbc:mysql://localhost/db1 \
> --username 'root' -P --table 'DebtCollectionCount' \
> --export-dir '/user/acadgild/project/USAConsumer/ProblemStatement4/' \
> --input-fields-terminated-by '\t' \
> -m 1
Warning: /usr/local/sqoop/../hcatalog does not exist! HCatalog jobs will fail.
Please set $HCAT_HOME to the root of your HCatalog installation.
Warning: /usr/local/sqoop/../accumulo does not exist! Accumulo imports will fail.
Please set $ACCUMULO_HOME to the root of your Accumulo installation.
Warning: /usr/local/sqoop/../zookeeper does not exist! Accumulo imports will fail.
Please set $ZOOKEEPER_HOME to the root of your Zookeeper installation.
2017-08-26 20:00:12,077 INFO  [main] sqoop.Sqoop: Running Sqoop version: 1.4.5
Enter password:
2017-08-26 20:00:13,317 INFO  [main] manager.MySQLManager: Preparing to use a MySQL streaming resultset.
2017-08-26 20:00:13,317 INFO  [main] tool.CodeGenTool: Beginning code generation
2017-08-26 20:00:13,602 INFO  [main] manager.SqlManager: Executing SQL statement: SELECT t.* FROM `DebtCollectionCount` AS t LIMIT 1
2017-08-26 20:00:13,631 INFO  [main] manager.SqlManager: Executing SQL statement: SELECT t.* FROM `DebtCollectionCount` AS t LIMIT 1
2017-08-26 20:00:13,637 INFO  [main] orm.CompilationManager: HADOOP_MAPRED_HOME is /usr/local/hadoop-2.6.0
```

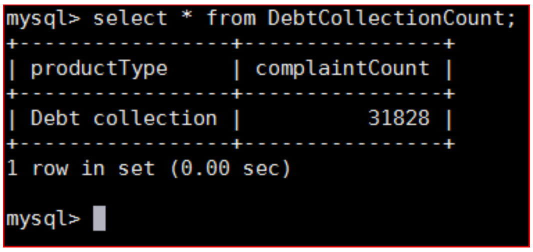


```
2017-08-26 20:00:17,328 INFO  [main] mapreduce.JobSubmitter: Submitting tokens for job: job_1503739494588_0034
2017-08-26 20:00:17,631 INFO  [main] impl.YarnClientImpl: Submitted application application_1503739494588_0034
2017-08-26 20:00:17,658 INFO  [main] mapreduce.Job: The url to track the job: http://http://localhost:8088/prox
2017-08-26 20:00:17,658 INFO  [main] mapreduce.Job: Running job: job_1503739494588_0034
2017-08-26 20:00:24,794 INFO  [main] mapreduce.Job: Job job_1503739494588_0034 running in uber mode : false
2017-08-26 20:00:24,795 INFO  [main] mapreduce.Job:  map 0% reduce 0%
2017-08-26 20:00:30,863 INFO  [main] mapreduce.Job:  map 100% reduce 0%
2017-08-26 20:00:30,876 INFO  [main] mapreduce.Job: Job job_1503739494588_0034 completed successfully
```

Sqoop command completed successfully.

Step 4: check table in mysql:

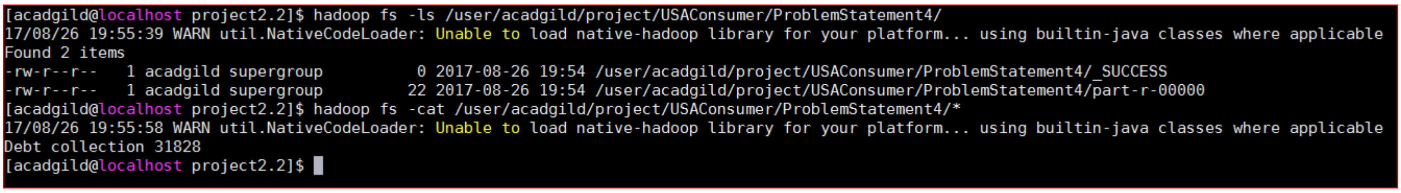
*select * from DebtCollectionCount;*



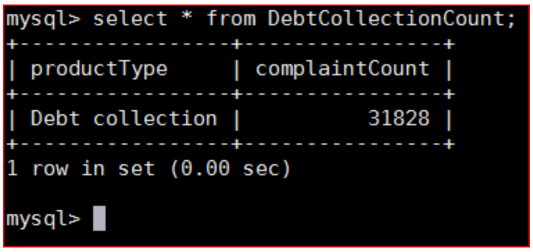
```
mysql> select * from DebtCollectionCount;
+-----------------+----------------+
| productType     | complaintCount |
+-----------------+----------------+
| Debt collection |          31828 |
+-----------------+----------------+
1 row in set (0.00 sec)

mysql> 
```

Step 5: Verify if all data have been exported from HDFS to MySQL:

Compare output of step 8 in first section and output of step 5 in second section:



```
[acadgild@localhost project2.2]$ hadoop fs -ls /user/acadgild/project/USAConsumer/ProblemStatement4/
17/08/26 19:55:39 WARN util.NativeCodeLoader: Unable to load native-hadoop library for your platform... using builtin-java classes where applicable
Found 2 items
-rw-r--r--   1 acadgild supergroup          0 2017-08-26 19:54 /user/acadgild/project/USAConsumer/ProblemStatement4/_SUCCESS
-rw-r--r--   1 acadgild supergroup         22 2017-08-26 19:54 /user/acadgild/project/USAConsumer/ProblemStatement4/part-r-00000
[acadgild@localhost project2.2]$ hadoop fs -cat /user/acadgild/project/USAConsumer/ProblemStatement4/*
17/08/26 19:55:58 WARN util.NativeCodeLoader: Unable to load native-hadoop library for your platform... using builtin-java classes where applicable
Debt collection 31828
[acadgild@localhost project2.2]$ 
```



```
mysql> select * from DebtCollectionCount;
+-----------------+----------------+
| productType     | complaintCount |
+-----------------+----------------+
| Debt collection |          31828 |
+-----------------+----------------+
1 row in set (0.00 sec)

mysql> 
```

As compared above all the data has been exported from HDFS to mysql using Sqoop.