# Hadoop File Formats Practical

# IMPORTANT

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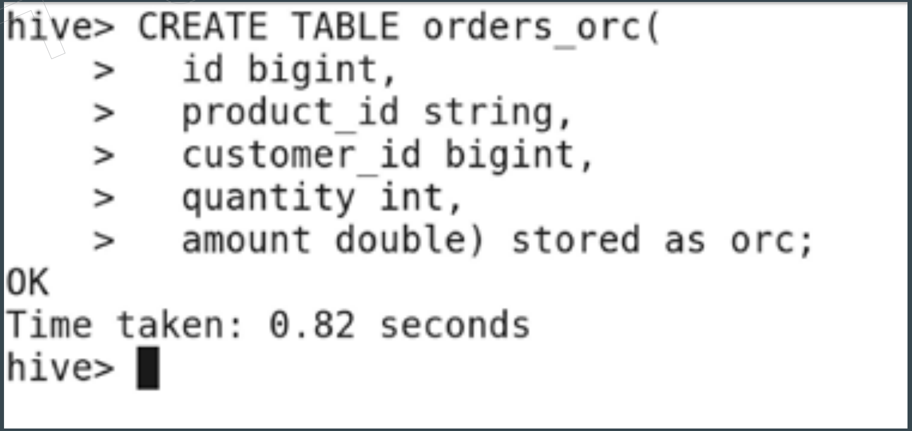
# Orc File Format

Create a table with orc file format named “orders_orc”

```
CREATE TABLE orders_orc(
  id bigint,
  product_id string,
  customer_id bigint,
  quantity int,
  amount double) stored as orc;
```

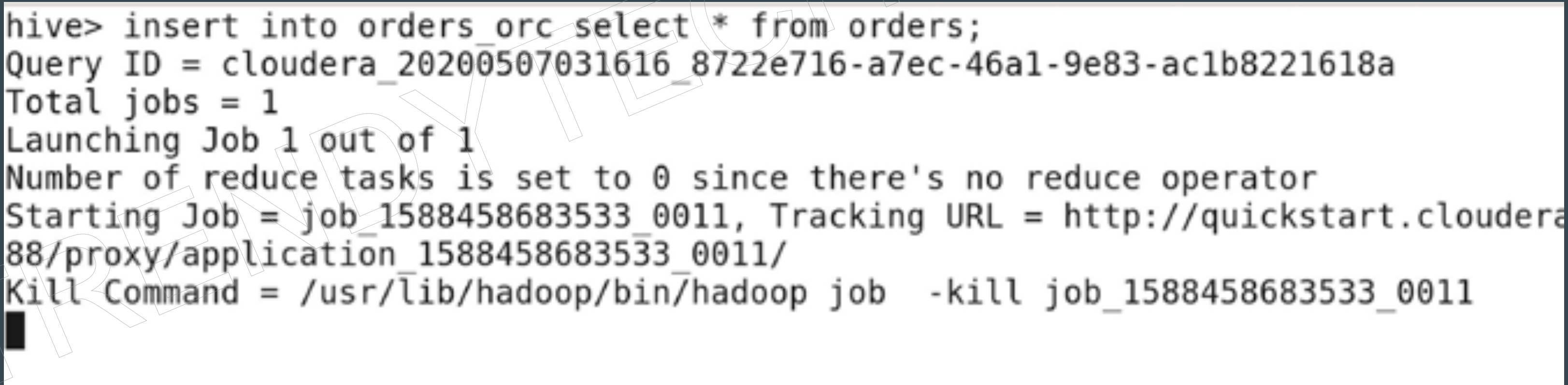


```
hive> CREATE TABLE orders_orc(
    >   id bigint,
    >   product_id string,
    >   customer_id bigint,
    >   quantity int,
    >   amount double) stored as orc;
OK
Time taken: 0.82 seconds
hive> 
```

# Orc File Format

Now insert the data in this table from orders table

insert into orders_orc select * from orders;



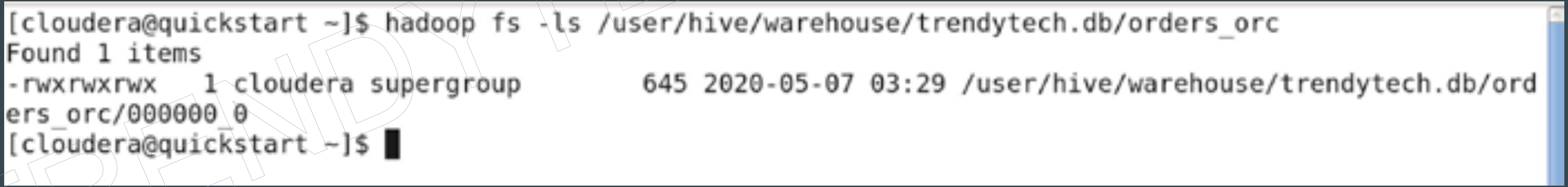
```
hive> insert into orders_orc select * from orders;
Query ID = cloudera_20200507031616_8722e716-a7ec-46a1-9e83-ac1b8221618a
Total jobs = 1
Launching Job 1 out of 1
Number of reduce tasks is set to 0 since there's no reduce operator
Starting Job = job_1588458683533_0011, Tracking URL = http://quickstart.cloudera
88/proxy/application_1588458683533_0011/
Kill Command = /usr/lib/hadoop/bin/hadoop job  -kill job_1588458683533_0011
█
```

# Orc File Format

**Now try to see the data in hdfs**

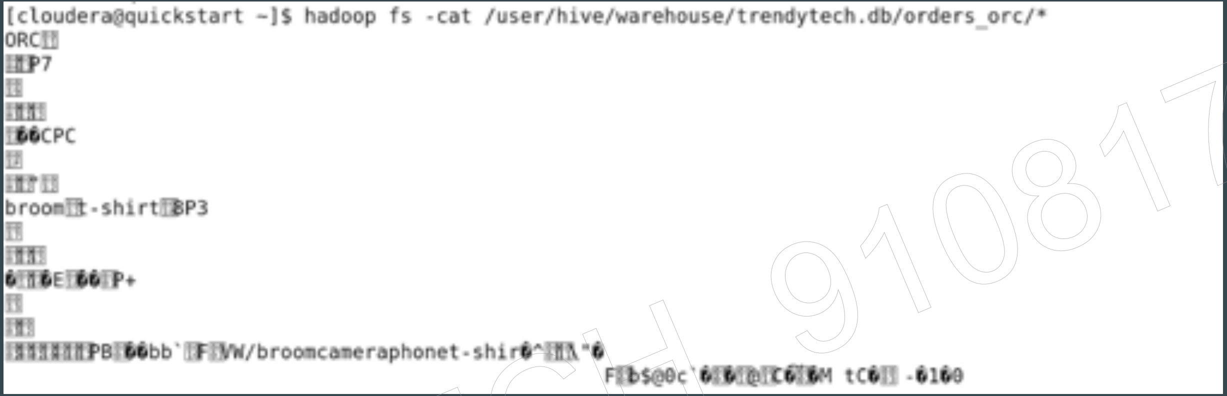
**hadoop fs -ls /user/hive/warehouse/trendytech.db/orders_orc/000000_0**

**hadoop fs -cat /user/hive/warehouse/trendytech.db/orders_orc/***



```
[cloudera@quickstart ~]$ hadoop fs -ls /user/hive/warehouse/trendytech.db/orders_orc
Found 1 items
-rwxrwxrwx   1 cloudera supergroup        645 2020-05-07 03:29 /user/hive/warehouse/trendytech.db/ord
ers_orc/000000_0
[cloudera@quickstart ~]$ 
```

# Orc File Format



```
[cloudera@quickstart ~]$ hadoop fs -cat /user/hive/warehouse/trendytech.db/orders_orc/*
ORC□□
□□P7
□□
□□□□
□��CPC
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broom□□t-shirt□BP3
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□□
□□□
□□□□□□□□PB□��bb`□F□VW/broomcameraphonet-shir�^□□\"�
                                                  F□b$@0c`�□�□@□C�□�M tC�□□ -�1�0
```

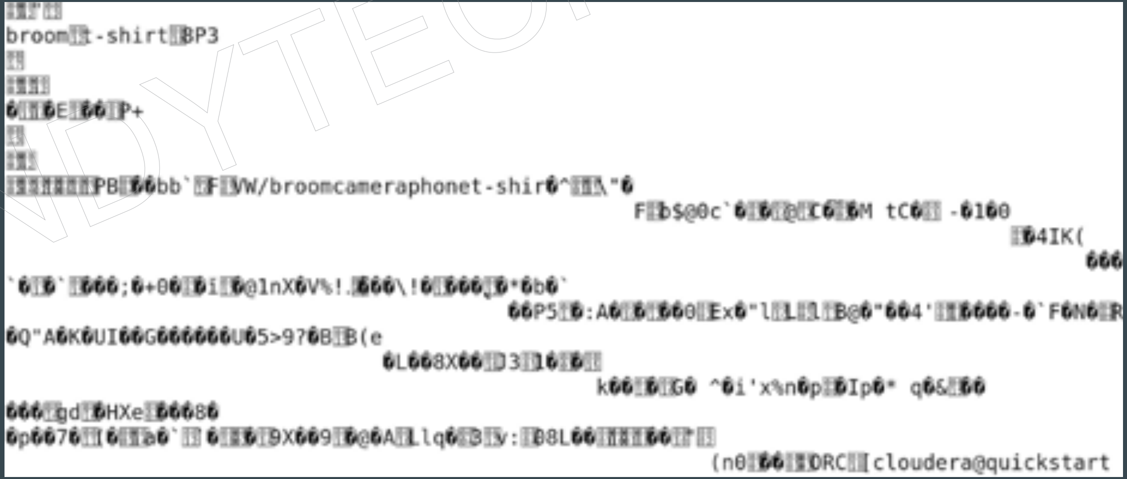

```
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broom□□t-shirt□BP3
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□□□□□□□□PB□��bb`□F□VW/broomcameraphonet-shir�^□□\"�
                                                  F□b$@0c`�□�□@□C�□�M tC�□□ -�1�0
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                                                 k��□�□G� ^�i'x%n�p□�Ip�* q�&□��
���□gd□�HXe□���8�
�p��7�□[�□□a�`□□ �□□�□9X��9□�@�A□Llq�□3□y:□�8L��□□□□��□"□□
                                                   (n0□��□□ORC□□[cloudera@quickstart
```
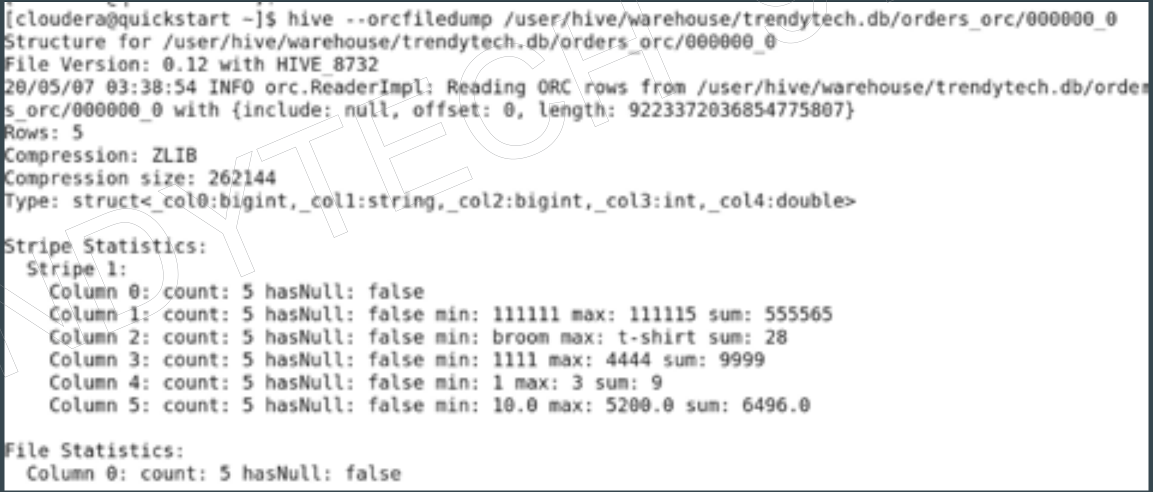

# Orc File Format

## To get information about an ORC file, use the orcfiledump command

**hive --orcfiledump /user/hive/warehouse/trendytech.db/orders_orc/000000_0**

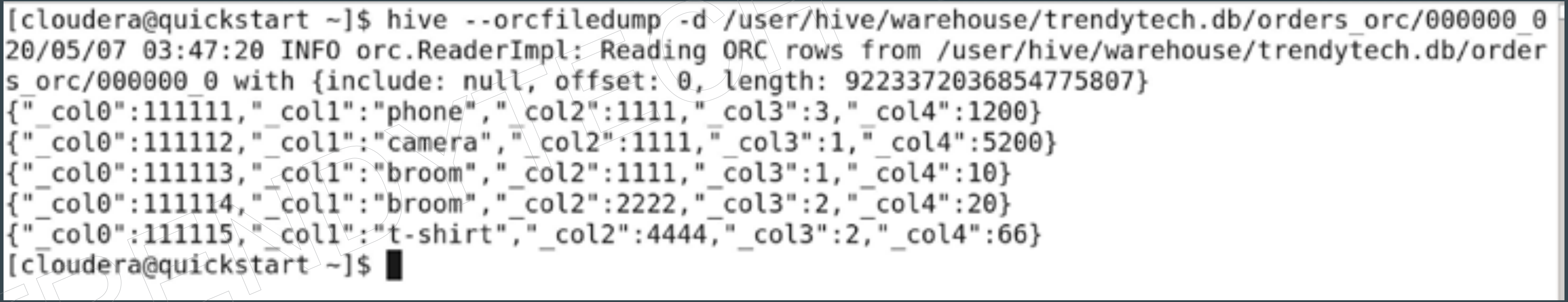


```
[cloudera@quickstart ~]$ hive --orcfiledump /user/hive/warehouse/trendytech.db/orders_orc/000000_0
Structure for /user/hive/warehouse/trendytech.db/orders_orc/000000_0
File Version: 0.12 with HIVE_8732
20/05/07 03:38:54 INFO orc.ReaderImpl: Reading ORC rows from /user/hive/warehouse/trendytech.db/order
s_orc/000000_0 with {include: null, offset: 0, length: 9223372036854775807}
Rows: 5
Compression: ZLIB
Compression size: 262144
Type: struct<_col0:bigint,_col1:string,_col2:bigint,_col3:int,_col4:double>

Stripe Statistics:
  Stripe 1:
    Column 0: count: 5 hasNull: false
    Column 1: count: 5 hasNull: false min: 111111 max: 111115 sum: 555565
    Column 2: count: 5 hasNull: false min: broom max: t-shirt sum: 28
    Column 3: count: 5 hasNull: false min: 1111 max: 4444 sum: 9999
    Column 4: count: 5 hasNull: false min: 1 max: 3 sum: 9
    Column 5: count: 5 hasNull: false min: 10.0 max: 5200.0 sum: 6496.0

File Statistics:
  Column 0: count: 5 hasNull: false
```

# Orc File Format

## To display the data in the ORC file, use

**hive --orcfiledump -d /user/hive/warehouse/trendytech.db/orders_orc/000000_0**

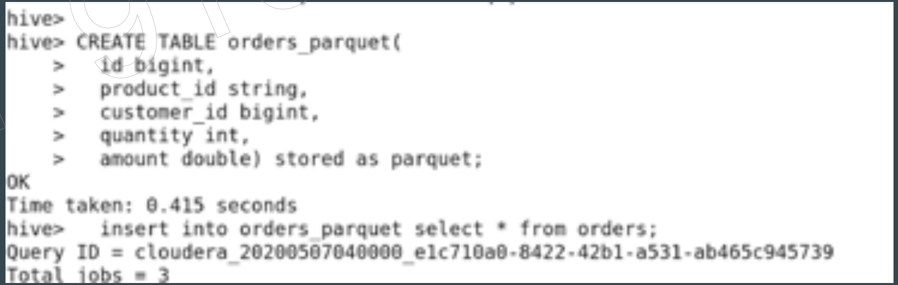


```
[cloudera@quickstart ~]$ hive --orcfiledump -d /user/hive/warehouse/trendytech.db/orders_orc/000000_0
20/05/07 03:47:20 INFO orc.ReaderImpl: Reading ORC rows from /user/hive/warehouse/trendytech.db/order
s_orc/000000_0 with {include: null, offset: 0, length: 9223372036854775807}
{"_col0":111111,"_col1":"phone","_col2":1111,"_col3":3,"_col4":1200}
{"_col0":111112,"_col1":"camera","_col2":1111,"_col3":1,"_col4":5200}
{"_col0":111113,"_col1":"broom","_col2":1111,"_col3":1,"_col4":10}
{"_col0":111114,"_col1":"broom","_col2":2222,"_col3":2,"_col4":20}
{"_col0":111115,"_col1":"t-shirt","_col2":4444,"_col3":2,"_col4":66}
[cloudera@quickstart ~]$ 
```

# Parquet File Format

**Create a table with parquet file format named “orders_parquet”**

```
CREATE TABLE orders_parquet(
  id bigint,
  product_id string,
  customer_id bigint,
  quantity int,
  amount double) stored as parquet;

insert into orders_parquet select * from orders;
```

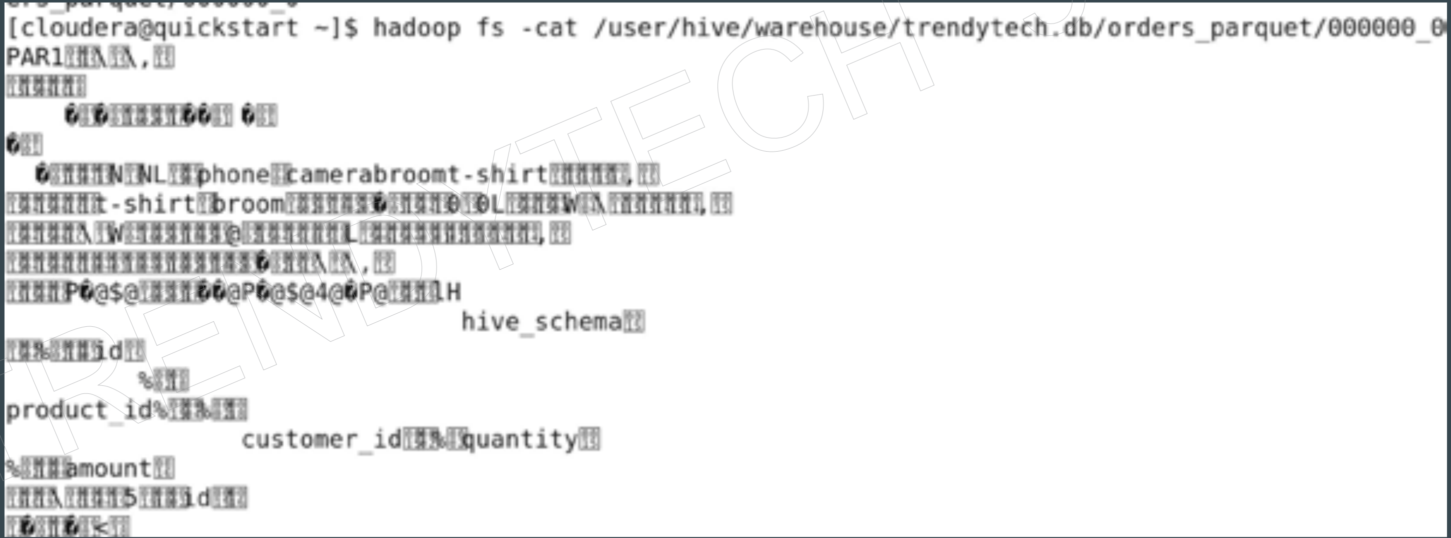


```
hive>
hive> CREATE TABLE orders_parquet(
    >   id bigint,
    >   product_id string,
    >   customer_id bigint,
    >   quantity int,
    >   amount double) stored as parquet;
OK
Time taken: 0.415 seconds
hive>   insert into orders_parquet select * from orders;
Query ID = cloudera_20200507040000_e1c710a0-8422-42b1-a531-ab465c945739
Total jobs = 3
```

# Parquet File Format

**Now try to see the data in hdfs**

**hadoop fs -cat /user/hive/warehouse/trendytech.db/orders_parquet/***



```
ers_parquet/000000_0
[cloudera@quickstart ~]$ hadoop fs -cat /user/hive/warehouse/trendytech.db/orders_parquet/000000_0
PAR1���\��\,��
�������
    ��������������� ���
���
  ������N�NL���phone�camerabroomt-shirt������,��
�������t-shirt�broom����������������0�0L������W�\��������,��
������\�W����������@�����������L�������������������,��
����������������������������������\��\,��
�����P��@$@�������@P��@$@4@��P@����lH
                                     hive_schema��
���%�����id��
           %���
product_id%���%���
                   customer_id���%��quantity��
%����amount��
����\�����5�����id���
���������<��
```

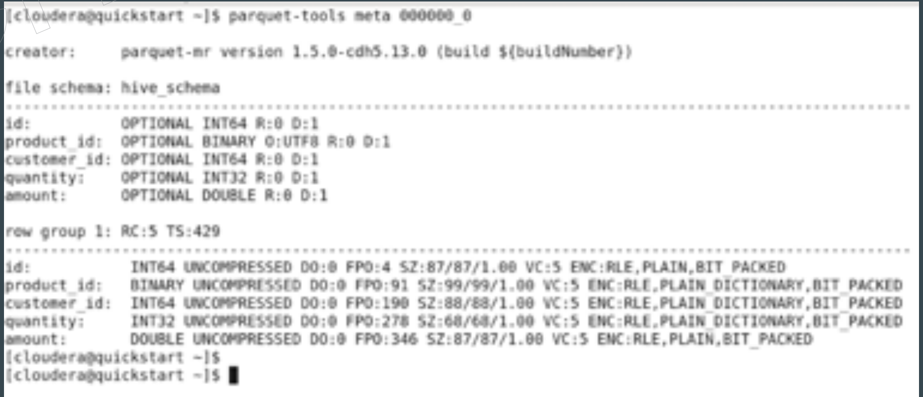
# Parquet File Format

**Now get the data from hdfs to local using get command.**

**hadoop fs -get /user/hive/warehouse/trendytech.db/orders_parquet/000000_0 .**

**Now try to see the metadata using below command.**

**parquet-tools meta 000000_0**

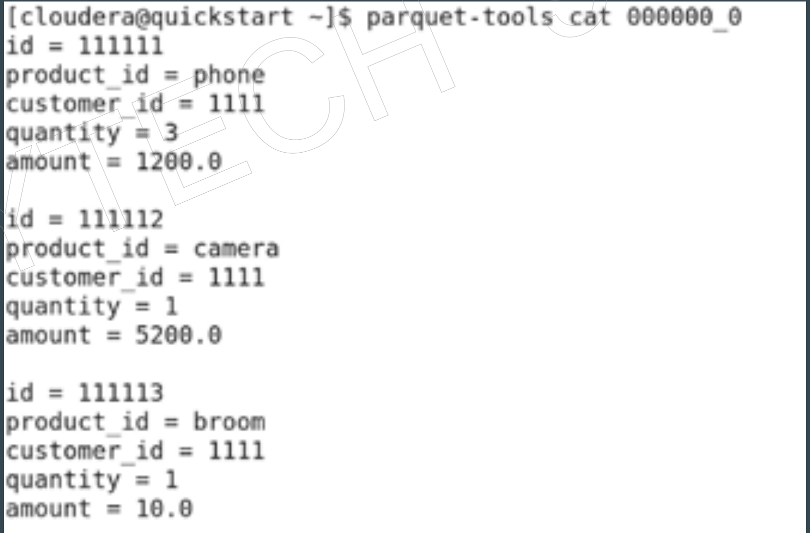


```
[cloudera@quickstart ~]$ parquet-tools meta 000000_0

creator:     parquet-mr version 1.5.0-cdh5.13.0 (build ${buildNumber})

file schema: hive_schema
--------------------------------------------------------------------------------------------------
id:          OPTIONAL INT64 R:0 D:1
product_id:  OPTIONAL BINARY O:UTF8 R:0 D:1
customer_id: OPTIONAL INT64 R:0 D:1
quantity:    OPTIONAL INT32 R:0 D:1
amount:      OPTIONAL DOUBLE R:0 D:1

row group 1: RC:5 TS:429
--------------------------------------------------------------------------------------------------
id:           INT64 UNCOMPRESSED DO:0 FPO:4 SZ:87/87/1.00 VC:5 ENC:RLE,PLAIN,BIT_PACKED
product_id:   BINARY UNCOMPRESSED DO:0 FPO:91 SZ:99/99/1.00 VC:5 ENC:RLE,PLAIN_DICTIONARY,BIT_PACKED
customer_id:  INT64 UNCOMPRESSED DO:0 FPO:190 SZ:88/88/1.00 VC:5 ENC:RLE,PLAIN_DICTIONARY,BIT_PACKED
quantity:     INT32 UNCOMPRESSED DO:0 FPO:278 SZ:68/68/1.00 VC:5 ENC:RLE,PLAIN_DICTIONARY,BIT_PACKED
amount:       DOUBLE UNCOMPRESSED DO:0 FPO:346 SZ:87/87/1.00 VC:5 ENC:RLE,PLAIN,BIT_PACKED
[cloudera@quickstart ~]$
[cloudera@quickstart ~]$ 
```

# Parquet File Format

**Now try to see the data using below command.**

**parquet-tools cat 000000_0**



```
[cloudera@quickstart ~]$ parquet-tools cat 000000_0
id = 111111
product_id = phone
customer_id = 1111
quantity = 3
amount = 1200.0

id = 111112
product_id = camera
customer_id = 1111
quantity = 1
amount = 5200.0

id = 111113
product_id = broom
customer_id = 1111
quantity = 1
amount = 10.0
```

# Json Serde

Ser + de

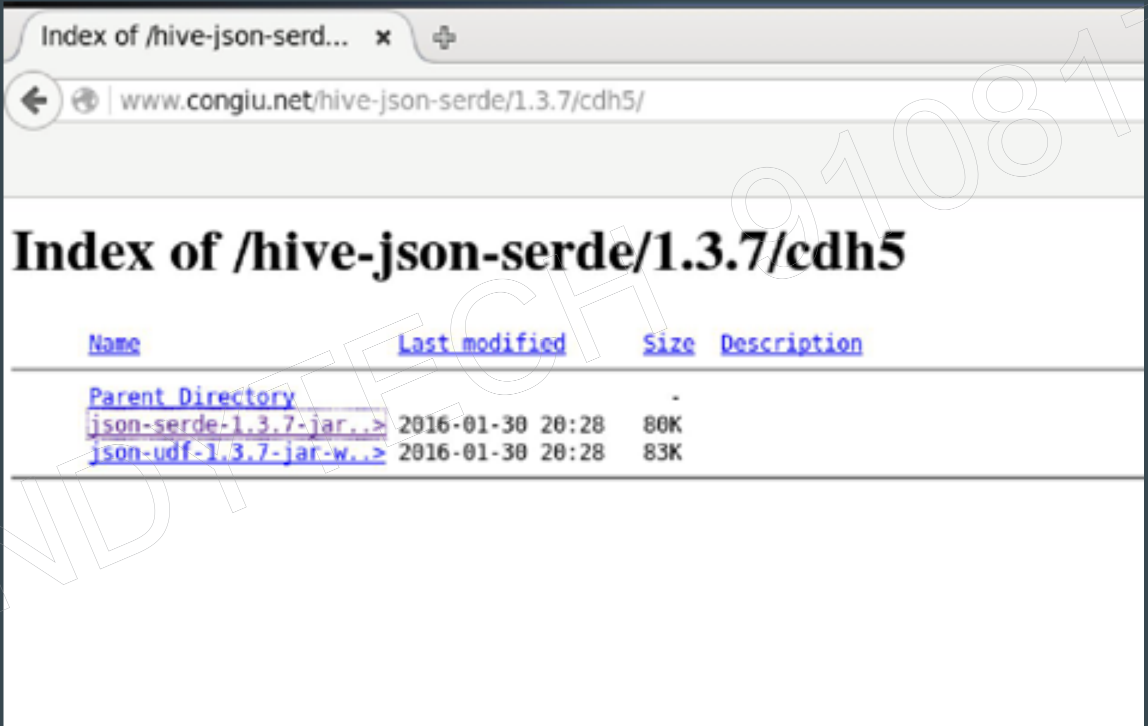
Serialization + Deserialization

There is no support for Json by default. So we need to add a jar and add that in hive.

Download the jar.

www.congiu.net/hive-json-serde/1.3.7/cdh5/json-serde-1.3.7-jar-with-dependencies.jar

# Json Serde

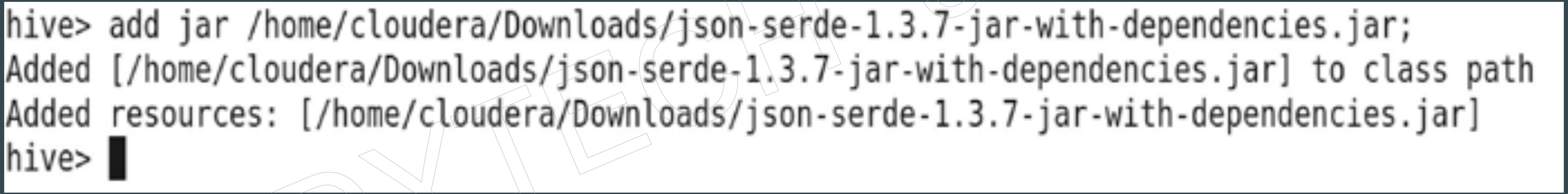

Index of /hive-json-serd...
www.congiu.net/hive-json-serde/1.3.7/cdh5/

# Index of /hive-json-serde/1.3.7/cdh5

```
      Name                      Last modified      Size  Description
-------------------------------------------------------------------
      Parent Directory                                -
      json-serde-1.3.7-jar..> 2016-01-30 20:28   80K
      json-udf-1.3.7-jar-w..> 2016-01-30 20:28   83K
-------------------------------------------------------------------
```

# Json Serde

## Now add the jar in hive using the below command as show.

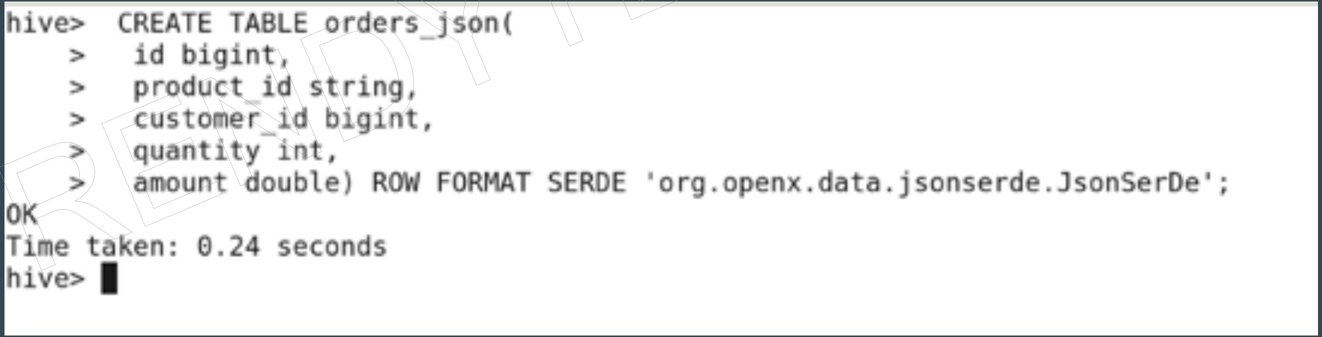


```
hive> add jar /home/cloudera/Downloads/json-serde-1.3.7-jar-with-dependencies.jar;
Added [/home/cloudera/Downloads/json-serde-1.3.7-jar-with-dependencies.jar] to class path
Added resources: [/home/cloudera/Downloads/json-serde-1.3.7-jar-with-dependencies.jar]
hive> 
```

# Json Serde

Create a table using json serde

```
CREATE TABLE orders_json(
  id bigint,
  product_id string,
  customer_id bigint,
  quantity int,
  amount double) ROW FORMAT SERDE 'org.openx.data.jsonserde.JsonSerDe';
```

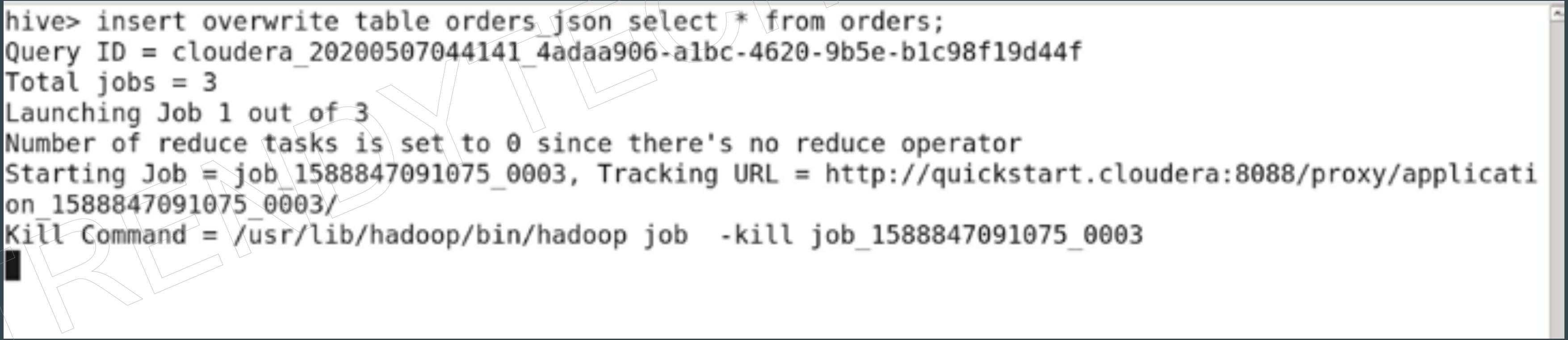


```
hive>  CREATE TABLE orders_json(
    >   id bigint,
    >   product_id string,
    >   customer_id bigint,
    >   quantity int,
    >   amount double) ROW FORMAT SERDE 'org.openx.data.jsonserde.JsonSerDe';
OK
Time taken: 0.24 seconds
hive> 
```

# Json Serde

Now insert the data in this table from orders table

insert overwrite table orders_json select * from orders;

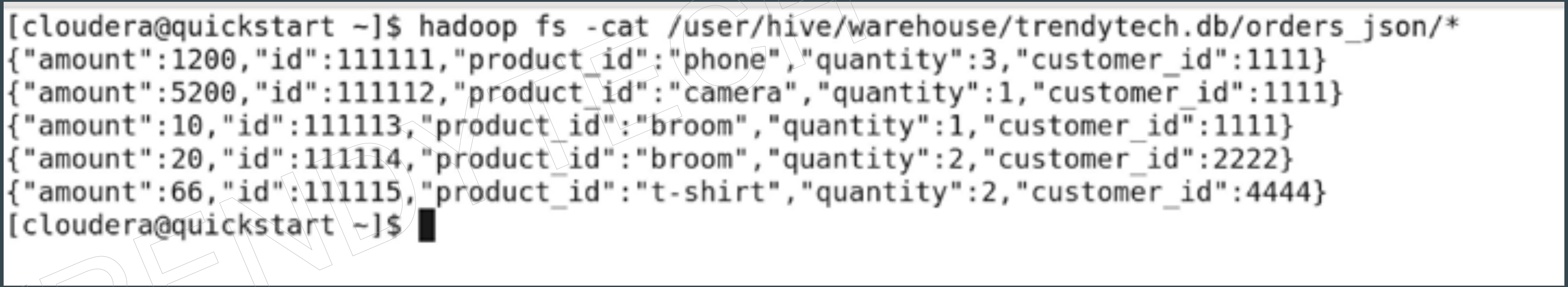


```
hive> insert overwrite table orders_json select * from orders;
Query ID = cloudera_20200507044141_4adaa906-a1bc-4620-9b5e-b1c98f19d44f
Total jobs = 3
Launching Job 1 out of 3
Number of reduce tasks is set to 0 since there's no reduce operator
Starting Job = job_1588847091075_0003, Tracking URL = http://quickstart.cloudera:8088/proxy/applicati
on_1588847091075_0003/
Kill Command = /usr/lib/hadoop/bin/hadoop job  -kill job_1588847091075_0003
```

# Json Serde

Now try to see the data in hdfs

hadoop fs -cat /user/hive/warehouse/trendytech.db/orders_json/*

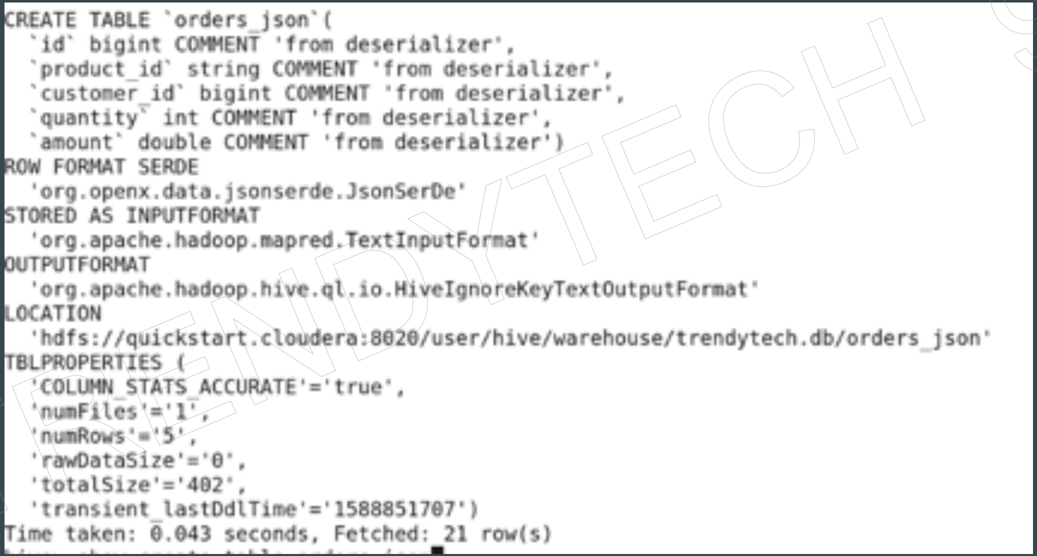


```
[cloudera@quickstart ~]$ hadoop fs -cat /user/hive/warehouse/trendytech.db/orders_json/*
{"amount":1200,"id":111111,"product_id":"phone","quantity":3,"customer_id":1111}
{"amount":5200,"id":111112,"product_id":"camera","quantity":1,"customer_id":1111}
{"amount":10,"id":111113,"product_id":"broom","quantity":1,"customer_id":1111}
{"amount":20,"id":111114,"product_id":"broom","quantity":2,"customer_id":2222}
{"amount":66,"id":111115,"product_id":"t-shirt","quantity":2,"customer_id":4444}
[cloudera@quickstart ~]$
```

# Json Serde

**To see all details related to table run the below command**

**show create table orders_json;**



```
CREATE TABLE `orders_json`(
  `id` bigint COMMENT 'from deserializer',
  `product_id` string COMMENT 'from deserializer',
  `customer_id` bigint COMMENT 'from deserializer',
  `quantity` int COMMENT 'from deserializer',
  `amount` double COMMENT 'from deserializer')
ROW FORMAT SERDE
  'org.openx.data.jsonserde.JsonSerDe'
STORED AS INPUTFORMAT
  'org.apache.hadoop.mapred.TextInputFormat'
OUTPUTFORMAT
  'org.apache.hadoop.hive.ql.io.HiveIgnoreKeyTextOutputFormat'
LOCATION
  'hdfs://quickstart.cloudera:8020/user/hive/warehouse/trendytech.db/orders_json'
TBLPROPERTIES (
  'COLUMN_STATS_ACCURATE'='true',
  'numFiles'='1',
  'numRows'='5',
  'rawDataSize'='0',
  'totalSize'='402',
  'transient_lastDdlTime'='1588851707')
Time taken: 0.043 seconds, Fetched: 21 row(s)
```

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| Instagram | bigdatabysumit |
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| Youtube | https://www.youtube.com/channel/UCbTggJVf0NDTfWX-C_gUGSg |