PRACTICAL-10

CREATING AND EXECUTING PIG LATIN SCRIPT

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Roll No: 40

What is Pig in Hadoop?

Pig is a scripting platform that runs on Hadoop clusters designed to process and analyze large datasets. Pig is extensible, self-optimizing, and easily programmed.

Programmers can use Pig to write data transformations without knowing Java. Pig uses both structured and unstructured data as input to perform analytics and uses HDFS to store the results.

Components of Pig

There are two major components of the Pig:

- Pig Latin script language
- A runtime engine

Pig Latin script language:

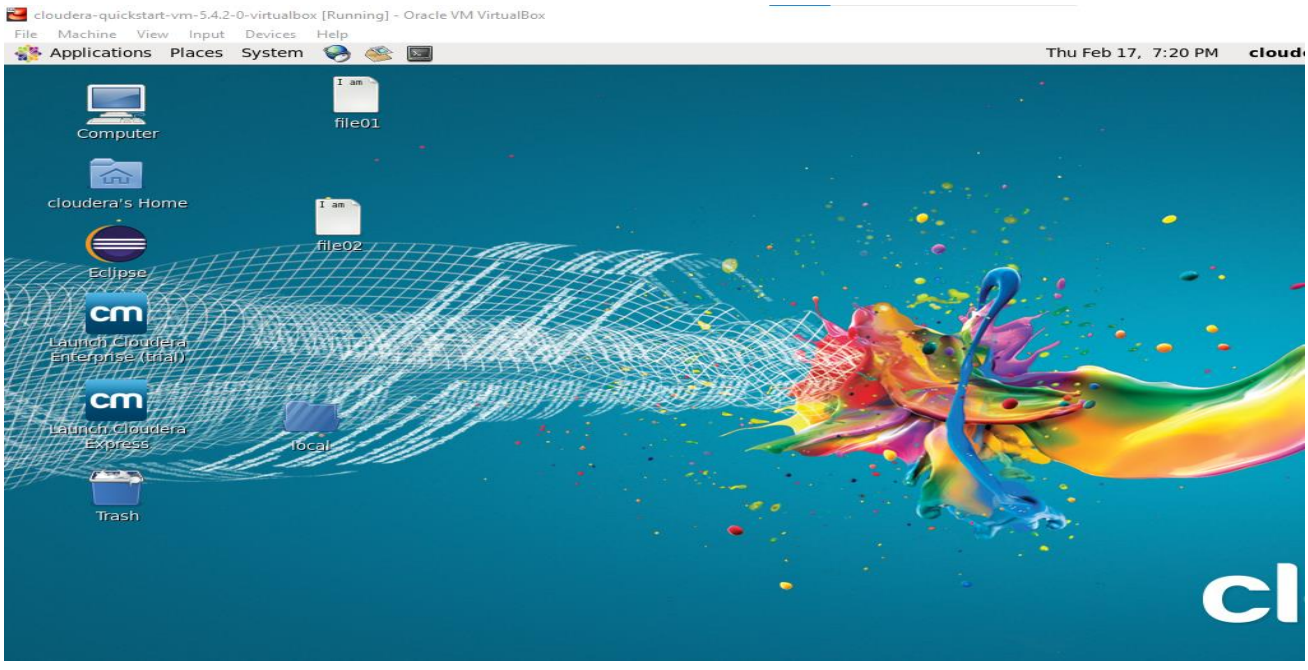
The Pig Latin script is a procedural data flow language. It contains syntax and commands that can be applied to implement business logic. Examples of Pig Latin are LOAD and STORE.

A runtime engine:

The runtime engine is a compiler that produces sequences of MapReduce programs. It uses HDFS to store and retrieve data. It is also used to interact with the Hadoop system (HDFS and MapReduce).

The runtime engine parses, validates, and compiles the script operations into a sequence of MapReduce jobs.

step1) Start the cloudera



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Step 2 : Now Open the terminal. And start Pig by typing pig on terminal.

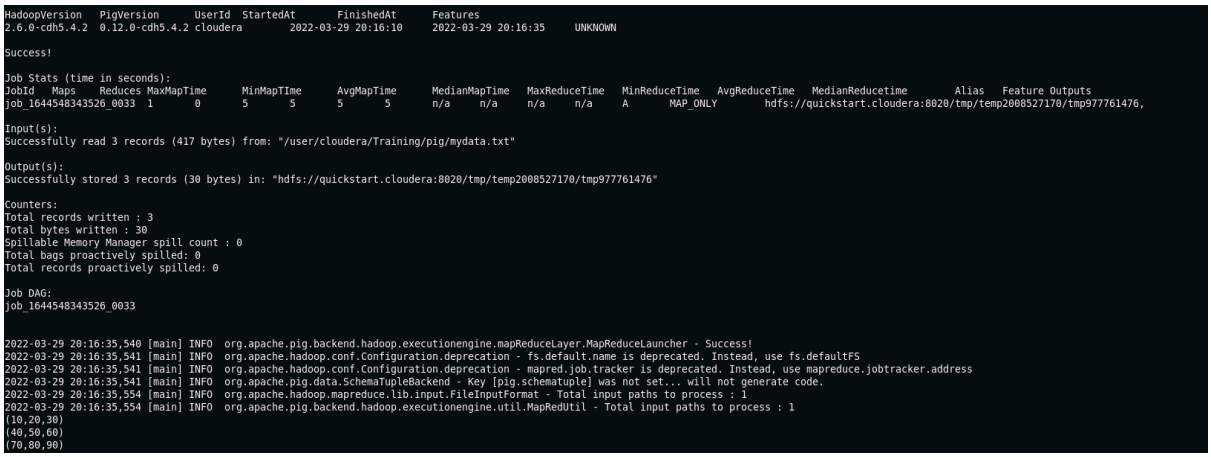
Step 3: now pig get started

Step 4: now load the file mydata.txt file,

A=LOAD '/user/cloudera/Training/pig/mydata.txt' AS (c1:int,c2:int,c3:int);

And then dump,

dump A;



Step 5: LOAD B

B=LOAD 'user/cloudera/Training/pig/mydata.txt.

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```
grunt> B = LOAD '/user/cloudera/training/pig/mydata.txt';
2022-03-29 20:19:09,155 [main] INFO  org.apache.hadoop.conf.Configuration.deprecation - fs.default.name is deprecated. Instead, use fs.defaultFS
2022-03-29 20:19:09,156 [main] INFO  org.apache.hadoop.conf.Configuration.deprecation - mapred.job.tracker is deprecated. Instead, use mapreduce.jobtracker.address
grunt> dump B;
2022-03-29 20:19:21,128 [main] INFO  org.apache.pig.tools.pigstats.ScriptState - Pig features used in the script: UNKNOWN
2022-03-29 20:19:21,129 [main] INFO  org.apache.pig.newplan.logical.optimizer.LogicalPlanOptimizer - {RULES_ENABLED=[AddForEach, ColumnMapKeyPrune, DuplicateForEachColumnRewrite, GroupByConstParallelSetter, ImplicitSplitInserter, LimitOp
timizer, LoadTypeCastInserter, MergeFilter, MergeForEach, NewPartitionFilterOptimizer, PushDownForEachFlatten, PushUpFilter, SplitFilter, StreamTypeCastInserter], RULES_DISABLED=[FilterLogicExpressionSimplifier, PartitionFilterOptimizer]
}
2022-03-29 20:19:21,135 [main] INFO  org.apache.pig.backend.hadoop.executionengine.mapReduceLayer.MRCompiler - File concatenation threshold: 100 optimistic? false
2022-03-29 20:19:21,136 [main] INFO  org.apache.pig.backend.hadoop.executionengine.mapReduceLayer.MultiQueryOptimizer - MR plan size before optimization: 1
2022-03-29 20:19:21,136 [main] INFO  org.apache.pig.backend.hadoop.executionengine.mapReduceLayer.MultiQueryOptimizer - MR plan size after optimization: 1
2022-03-29 20:19:21,153 [main] INFO  org.apache.hadoop.yarn.client.RMProxy - Connecting to ResourceManager at /0.0.0.0:8032
2022-03-29 20:19:21,155 [main] INFO  org.apache.pig.tools.pigstats.ScriptState - Pig script settings are added to the job
2022-03-29 20:19:21,157 [main] INFO  org.apache.pig.backend.hadoop.executionengine.mapReduceLayer.JobControlCompiler - mapred.job.reduce.markreset.buffer.percent is not set, set to default 0.3
2022-03-29 20:19:21,409 [main] INFO  org.apache.pig.backend.hadoop.executionengine.mapReduceLayer.JobControlCompiler - creating jar file Job8711437822572202530.jar
2022-03-29 20:19:24,396 [main] INFO  org.apache.pig.backend.hadoop.executionengine.mapReduceLayer.JobControlCompiler - jar file Job8711437822572202530.jar created
2022-03-29 20:19:24,405 [main] INFO  org.apache.pig.backend.hadoop.executionengine.mapReduceLayer.JobControlCompiler - Setting up single store job
2022-03-29 20:19:24,414 [main] INFO  org.apache.pig.backend.hadoop.executionengine.mapReduceLayer.MapReduceLauncher - 1 map-reduce job(s) waiting for submission.
2022-03-29 20:19:24,414 [main] INFO  org.apache.hadoop.conf.Configuration.deprecation - mapred.job.tracker is deprecated. Instead, use mapreduce.jobtracker.address
2022-03-29 20:19:24,417 [JobControl] INFO  org.apache.hadoop.yarn.client.RMProxy - Connecting to ResourceManager at /0.0.0.0:8032
2022-03-29 20:19:24,430 [JobControl] INFO  org.apache.hadoop.conf.Configuration.deprecation - fs.default.name is deprecated. Instead, use fs.defaultFS
2022-03-29 20:19:24,593 [JobControl] INFO  org.apache.hadoop.mapreduce.lib.input.FileInputFormat - Total input paths to process : 1
2022-03-29 20:19:24,594 [JobControl] INFO  org.apache.pig.backend.hadoop.executionengine.util.MapRedUtil - Total input paths to process : 1
2022-03-29 20:19:24,596 [JobControl] INFO  org.apache.pig.backend.hadoop.executionengine.util.MapRedUtil - Total input paths (combined) to process : 1
2022-03-29 20:19:24,637 [JobControl] INFO  org.apache.hadoop.mapreduce.JobSubmitter - number of splits:1
2022-03-29 20:19:24,722 [JobControl] INFO  org.apache.hadoop.mapreduce.JobSubmitter - Submitting tokens for job: job_1644548343526_0034
2022-03-29 20:19:24,758 [JobControl] INFO  org.apache.hadoop.yarn.client.api.impl.YarnClientImpl - Submitted application application_1644548343526_0034
2022-03-29 20:19:24,759 [JobControl] INFO  org.apache.hadoop.mapreduce.Job - The url to track the job: http://quickstart.cloudera:8088/proxy/application_1644548343526_0034/
2022-03-29 20:19:24,915 [main] INFO  org.apache.pig.backend.hadoop.executionengine.mapReduceLayer.MapReduceLauncher - HadoopJobId: job_1644548343526_0034
2022-03-29 20:19:24,915 [main] INFO  org.apache.pig.backend.hadoop.executionengine.mapReduceLayer.MapReduceLauncher - Processing aliases B
2022-03-29 20:19:24,915 [main] INFO  org.apache.pig.backend.hadoop.executionengine.mapReduceLayer.MapReduceLauncher - detailed locations: M: B[4,4] C:  R:
2022-03-29 20:19:24,915 [main] INFO  org.apache.pig.backend.hadoop.executionengine.mapReduceLayer.MapReduceLauncher - More information at: http://localhost:50030/jobdetails.jsp?jobid=job_1644548343526_0034
2022-03-29 20:19:24,959 [main] INFO  org.apache.pig.backend.hadoop.executionengine.mapReduceLayer.MapReduceLauncher - 0% complete
2022-03-29 20:19:37,779 [main] INFO  org.apache.pig.backend.hadoop.executionengine.mapReduceLayer.MapReduceLauncher - 50% complete
2022-03-29 20:19:39,988 [main] INFO  org.apache.pig.backend.hadoop.executionengine.mapReduceLayer.MapReduceLauncher - 100% complete
2022-03-29 20:19:39,989 [main] INFO  org.apache.pig.tools.pigstats.SimplePigStats - Script Statistics:

HadoopVersion   PigVersion      UserId  StartedAt       FinishedAt      Features
2.6.0-cdh5.4.2  0.12.0-cdh5.4.2 cloudera        2022-03-29 20:19:21     2022-03-29 20:19:39     UNKNOWN

Success!

Job Stats (time in seconds):
```

```
Counters:
Total records written : 3
Total bytes written : 50
Spillable Memory Manager spill count : 0
Total bags proactively spilled: 0
Total records proactively spilled: 0

Job DAG:
job_1644548343526_0034


2022-03-29 20:19:40,055 [main] INFO  org.apache.pig.backend.hadoop.executionengine.mapReduceLayer.MapReduceLauncher - Success!
2022-03-29 20:19:40,055 [main] INFO  org.apache.hadoop.conf.Configuration.deprecation - fs.default.name is deprecated. Instead, use fs.defaultFS
2022-03-29 20:19:40,055 [main] INFO  org.apache.hadoop.conf.Configuration.deprecation - mapred.job.tracker is deprecated. Instead, use mapreduce.jobtracker.address
2022-03-29 20:19:40,056 [main] WARN  org.apache.pig.data.SchemaTupleBackend - SchemaTupleBackend has already been initialized
2022-03-29 20:19:40,061 [main] INFO  org.apache.hadoop.mapreduce.lib.input.FileInputFormat - Total input paths to process : 1
2022-03-29 20:19:40,061 [main] INFO  org.apache.pig.backend.hadoop.executionengine.util.MapRedUtil - Total input paths to process : 1
(10,20,30,)
(40,50,60,)
(70,80,90)
```

Step 6:now check Schema of A.

```
grunt> DESCRIBE A;
A: {c1: int,c2: int,c3: int}
grunt> DESCRIBE B;
Schema for B unknown.
```

Step 7: ILLUSTRATE A

```
grunt> ILLUSTRATE A;
2022-03-29 20:25:47,127 [main] INFO  org.apache.hadoop.conf.Configuration.deprecation - fs.default.name is deprecated. Instead, use fs.defaultFS
2022-03-29 20:25:47,127 [main] INFO  org.apache.hadoop.conf.Configuration.deprecation - mapred.job.tracker is deprecated. Instead, use mapreduce.jobtracker.address
2022-03-29 20:25:47,127 [main] INFO  org.apache.pig.backend.hadoop.executionengine.HExecutionEngine - Connecting to hadoop file system at: hdfs://quickstart.cloudera:8020
2022-03-29 20:25:47,128 [main] INFO  org.apache.pig.backend.hadoop.executionengine.HExecutionEngine - Connecting to map-reduce job tracker at: localhost:8021
2022-03-29 20:25:47,128 [main] INFO  org.apache.pig.newplan.logical.optimizer.LogicalPlanOptimizer - {RULES_ENABLED=[DuplicateForEachColumnRewrite, ImplicitSplitInserter, LoadTypeCastInserter, NewPartition
nserter], RULES_DISABLED=[AddForEach, ColumnMapKeyPrune, FilterLogicExpressionSimplifier, GroupByConstParallelSetter, LimitOptimizer, MergeFilter, MergeForEach, PartitionFilterOptimizer, PushDownForEachFla
}
2022-03-29 20:25:47,136 [main] INFO  org.apache.pig.backend.hadoop.executionengine.mapReduceLayer.MRCompiler - File concatenation threshold: 100 optimistic? false
2022-03-29 20:25:47,137 [main] INFO  org.apache.pig.backend.hadoop.executionengine.mapReduceLayer.MultiQueryOptimizer - MR plan size before optimization: 1
2022-03-29 20:25:47,137 [main] INFO  org.apache.pig.backend.hadoop.executionengine.mapReduceLayer.MultiQueryOptimizer - MR plan size after optimization: 1
2022-03-29 20:25:47,138 [main] INFO  org.apache.pig.tools.pigstats.ScriptState - Pig script settings are added to the job
2022-03-29 20:25:47,138 [main] INFO  org.apache.pig.backend.hadoop.executionengine.mapReduceLayer.JobControlCompiler - mapred.job.reduce.markreset.buffer.percent is not set, set to default 0.3
2022-03-29 20:25:47,183 [main] WARN  org.apache.pig.data.SchemaTupleBackend - SchemaTupleBackend has already been initialized
2022-03-29 20:25:47,200 [main] INFO  org.apache.pig.backend.hadoop.executionengine.mapReduceLayer.PigMapOnly$Map - Aliases being processed per job phase (AliasName[line,offset]): M: A[3,4] C:  R:
2022-03-29 20:25:47,204 [main] INFO  org.apache.hadoop.mapreduce.lib.input.FileInputFormat - Total input paths to process : 1
2022-03-29 20:25:47,204 [main] INFO  org.apache.pig.backend.hadoop.executionengine.util.MapRedUtil - Total input paths to process : 1
2022-03-29 20:25:47,227 [main] INFO  org.apache.pig.backend.hadoop.executionengine.mapReduceLayer.MRCompiler - File concatenation threshold: 100 optimistic? false
2022-03-29 20:25:47,230 [main] INFO  org.apache.pig.backend.hadoop.executionengine.mapReduceLayer.MultiQueryOptimizer - MR plan size before optimization: 1
2022-03-29 20:25:47,230 [main] INFO  org.apache.pig.backend.hadoop.executionengine.mapReduceLayer.MultiQueryOptimizer - MR plan size after optimization: 1
2022-03-29 20:25:47,230 [main] INFO  org.apache.pig.tools.pigstats.ScriptState - Pig script settings are added to the job
2022-03-29 20:25:47,230 [main] INFO  org.apache.pig.backend.hadoop.executionengine.mapReduceLayer.JobControlCompiler - mapred.job.reduce.markreset.buffer.percent is not set, set to default 0.3
2022-03-29 20:25:47,250 [main] WARN  org.apache.pig.data.SchemaTupleBackend - SchemaTupleBackend has already been initialized
2022-03-29 20:25:47,255 [main] INFO  org.apache.pig.backend.hadoop.executionengine.mapReduceLayer.PigMapOnly$Map - Aliases being processed per job phase (AliasName[line,offset]): M: A[3,4] C:  R:
2022-03-29 20:25:47,258 [main] INFO  org.apache.pig.backend.hadoop.executionengine.mapReduceLayer.MRCompiler - File concatenation threshold: 100 optimistic? false
2022-03-29 20:25:47,259 [main] INFO  org.apache.pig.backend.hadoop.executionengine.mapReduceLayer.MultiQueryOptimizer - MR plan size before optimization: 1
2022-03-29 20:25:47,259 [main] INFO  org.apache.pig.backend.hadoop.executionengine.mapReduceLayer.MultiQueryOptimizer - MR plan size after optimization: 1
2022-03-29 20:25:47,259 [main] INFO  org.apache.pig.tools.pigstats.ScriptState - Pig script settings are added to the job
2022-03-29 20:25:47,259 [main] INFO  org.apache.pig.backend.hadoop.executionengine.mapReduceLayer.JobControlCompiler - mapred.job.reduce.markreset.buffer.percent is not set, set to default 0.3
2022-03-29 20:25:47,308 [main] WARN  org.apache.pig.data.SchemaTupleBackend - SchemaTupleBackend has already been initialized
2022-03-29 20:25:47,311 [main] INFO  org.apache.pig.backend.hadoop.executionengine.mapReduceLayer.PigMapOnly$Map - Aliases being processed per job phase (AliasName[line,offset]): M: A[3,4] C:  R:
(70,80,90)
2022-03-29 20:25:47,314 [main] INFO  org.apache.pig.backend.hadoop.executionengine.mapReduceLayer.MRCompiler - File concatenation threshold: 100 optimistic? false
2022-03-29 20:25:47,315 [main] INFO  org.apache.pig.backend.hadoop.executionengine.mapReduceLayer.MultiQueryOptimizer - MR plan size before optimization: 1
```

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```
-----------------------------------------------
| A      | c1:int     | c2:int     | c3:int     |
-----------------------------------------------
|        | 70         | 80         | 90         |
-----------------------------------------------
```

File name : STUDENT.txt

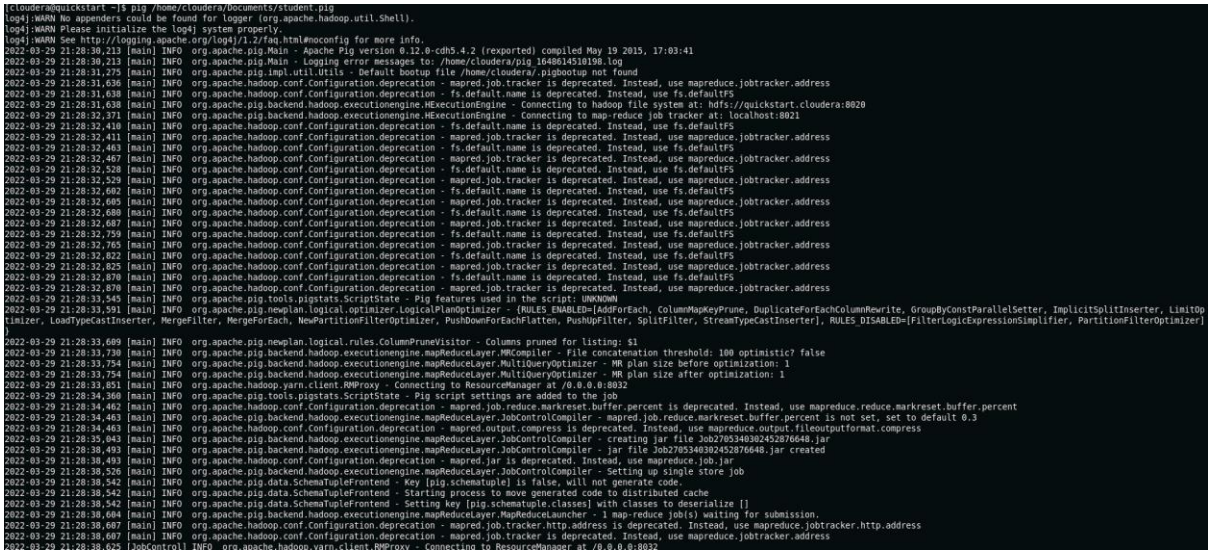
All the data available in this file

mydata.txt | STUDENT1.txt | student.pig

```
1,REHAN,22,NEW YORK,20000,2019-05-10
2,RISHI,21,FLORIDA,15000,2018-09-11
3,SHIVAM,23,BOSTON,17000,2020-10-10
4,ANAND,24,CALIFORNIA,25000,2021-10-30
5,PRINCE,23,CHICAGO,21000,2022-02-15
6,AMANDEEP,22,SEATTLE,14000,2018-03-14
```

Step 8: pig/home/cloudera/Documents/student.pig

Pig script file.



```
Success!

Job Stats (time in seconds):
JobId   Maps    Reduces MaxMapTime      MinMapTIme      AvgMapTime      MedianMapTime   MaxReduceTime   MinReduceTime   AvgReduceTime   MedianReducetime        Alias   Feature Outputs
job_1644548343526_0039  1       0       6       6       6       6       n/a     n/a     n/a     n/a     listing MAP_ONLY        hdfs://quickstart.cloudera:8020/tmp/temp262147121/tmp-385917375,

Input(s):
Successfully read 6 records (614 bytes) from: "/user/cloudera/Training/pig/STUDENT1.txt"

Output(s):
Successfully stored 6 records (194 bytes) in: "hdfs://quickstart.cloudera:8020/tmp/temp262147121/tmp-385917375"

Counters:
Total records written : 6
Total bytes written : 194
Spillable Memory Manager spill count : 0
Total bags proactively spilled: 0
Total records proactively spilled: 0

Job DAG:
job_1644548343526_0039


2022-03-29 21:29:00,458 [main] INFO  org.apache.pig.backend.hadoop.executionengine.mapReduceLayer.MapReduceLauncher - Success!
2022-03-29 21:29:00,461 [main] INFO  org.apache.hadoop.conf.Configuration.deprecation - fs.default.name is deprecated. Instead, use fs.defaultFS
2022-03-29 21:29:00,461 [main] INFO  org.apache.hadoop.conf.Configuration.deprecation - mapred.job.tracker is deprecated. Instead, use mapreduce.jobtracker.address
2022-03-29 21:29:00,463 [main] INFO  org.apache.pig.data.SchemaTupleBackend - Key [pig.schematuple] was not set... will not generate code.
2022-03-29 21:29:00,479 [main] INFO  org.apache.hadoop.mapreduce.lib.input.FileInputFormat - Total input paths to process : 1
2022-03-29 21:29:00,479 [main] INFO  org.apache.pig.backend.hadoop.executionengine.util.MapRedUtil - Total input paths to process : 1
(1,2019-01-10T00:00:00.000-08:00,20000,22,NEW YORK)
(2,2018-01-11T00:00:00.000-08:00,15000,21,FLORIDA)
(3,2020-01-10T00:00:00.000-08:00,17000,23,BOSTON)
(4,2021-01-30T00:00:00.000-08:00,25000,24,CALIFORNIA)
(5,2022-01-15T00:00:00.000-08:00,21000,23,CHICAGO)
(6,2018-01-14T00:00:00.000-08:00,14000,22,SEATTLE)
2022-03-29 21:29:00,626 [main] INFO  org.apache.hadoop.conf.Configuration.deprecation - fs.default.name is deprecated. Instead, use fs.defaultFS
2022-03-29 21:29:00,626 [main] INFO  org.apache.hadoop.conf.Configuration.deprecation - mapred.job.tracker is deprecated. Instead, use mapreduce.jobtracker.address
```

Display the patricular data:

Step 9:

Mention the data which we want to check. It will be display in listing form.

```
(2,RISHI,21,FLORIDA,15000,2018-09-11)
2022-03-29 21:35:36,565 [main] INFO  org.apache.pig.backend.hadoop.executionengine.mapReduceLayer.MRCompiler - File concatenation threshold: 100 optimistic? false
2022-03-29 21:35:36,575 [main] INFO  org.apache.pig.backend.hadoop.executionengine.mapReduceLayer.MultiQueryOptimizer - MR plan size before optimization: 1
2022-03-29 21:35:36,575 [main] INFO  org.apache.pig.backend.hadoop.executionengine.mapReduceLayer.MultiQueryOptimizer - MR plan size after optimization: 1
2022-03-29 21:35:36,576 [main] INFO  org.apache.pig.tools.pigstats.ScriptState - Pig script settings are added to the job
2022-03-29 21:35:36,581 [main] INFO  org.apache.pig.backend.hadoop.executionengine.mapReduceLayer.JobControlCompiler - mapred.job.reduce.markreset.buffer.percent is not set, set to default 0.3
2022-03-29 21:35:36,620 [main] WARN  org.apache.pig.data.SchemaTupleBackend - SchemaTupleBackend has already been initialized
2022-03-29 21:35:36,632 [main] INFO  org.apache.pig.backend.hadoop.executionengine.mapReduceLayer.PigMapOnly$Map - Aliases being processed per job phase (AliasName[line,offset]): M: listing[1,10],listing[-1,-1],listing[3,10] C:  R:
2022-03-29 21:35:36,633 [main] INFO  org.apache.pig.backend.hadoop.executionengine.mapReduceLayer.MRCompiler - File concatenation threshold: 100 optimistic? false
2022-03-29 21:35:36,637 [main] INFO  org.apache.pig.backend.hadoop.executionengine.mapReduceLayer.MultiQueryOptimizer - MR plan size before optimization: 1
2022-03-29 21:35:36,637 [main] INFO  org.apache.pig.backend.hadoop.executionengine.mapReduceLayer.MultiQueryOptimizer - MR plan size after optimization: 1
2022-03-29 21:35:36,638 [main] INFO  org.apache.pig.tools.pigstats.ScriptState - Pig script settings are added to the job
2022-03-29 21:35:36,639 [main] INFO  org.apache.pig.backend.hadoop.executionengine.mapReduceLayer.JobControlCompiler - mapred.job.reduce.markreset.buffer.percent is not set, set to default 0.3
2022-03-29 21:35:36,671 [main] WARN  org.apache.pig.data.SchemaTupleBackend - SchemaTupleBackend has already been initialized
2022-03-29 21:35:36,674 [main] INFO  org.apache.pig.backend.hadoop.executionengine.mapReduceLayer.PigMapOnly$Map - Aliases being processed per job phase (AliasName[line,offset]): M: listing[1,10],listing[-1,-1],listing[3,10] C:  R:
2022-03-29 21:35:36,680 [main] INFO  org.apache.pig.backend.hadoop.executionengine.mapReduceLayer.MRCompiler - File concatenation threshold: 100 optimistic? false
2022-03-29 21:35:36,687 [main] INFO  org.apache.pig.backend.hadoop.executionengine.mapReduceLayer.MultiQueryOptimizer - MR plan size before optimization: 1
2022-03-29 21:35:36,687 [main] INFO  org.apache.pig.backend.hadoop.executionengine.mapReduceLayer.MultiQueryOptimizer - MR plan size after optimization: 1
2022-03-29 21:35:36,688 [main] INFO  org.apache.pig.tools.pigstats.ScriptState - Pig script settings are added to the job
2022-03-29 21:35:36,688 [main] INFO  org.apache.pig.backend.hadoop.executionengine.mapReduceLayer.JobControlCompiler - mapred.job.reduce.markreset.buffer.percent is not set, set to default 0.3
2022-03-29 21:35:36,707 [main] WARN  org.apache.pig.data.SchemaTupleBackend - SchemaTupleBackend has already been initialized
2022-03-29 21:35:36,725 [main] INFO  org.apache.pig.backend.hadoop.executionengine.mapReduceLayer.PigMapOnly$Map - Aliases being processed per job phase (AliasName[line,offset]): M: listing[1,10],listing[-1,-1],listing[3,10] C:  R:
-------------------------------------------------------------------------------------------------------------------
| listing     | sid:int     | name:chararray     | age:int     | address:chararray     | salary:long     | date:chararray     |
-------------------------------------------------------------------------------------------------------------------
|             | 2           | RISHI              | 21          | FLORIDA               | 15000           | 2018-09-11         |
-------------------------------------------------------------------------------------------------------------------

-------------------------------------------------------------------------------------------------------------------
| listing     | sid:int     | name:datetime                 | date:chararray     | salary:long     | age:int     | address:chararray     |
-------------------------------------------------------------------------------------------------------------------
|             | 2           | 2018-01-11T00:00:00.000-08:00 | 2018-09-11         | 15000           | 21          | FLORIDA               |
-------------------------------------------------------------------------------------------------------------------
```