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hduser@bmsce-Precision-T1700:~/khushil/join/MapReduceJoin$ hdfs dfs -ls /khushil_join
ls: `/khushil_join': No such file or directory
hduser@bmsce-Precision-T1700:~/khushil/join/MapReduceJoin$ hdfs dfs -mkdir /khushil_join
hduser@bmsce-Precision-T1700:~/khushil/join/MapReduceJoin$ hdfs dfs -ls /khushil_join
hduser@bmsce-Precision-T1700:~/khushil/join/MapReduceJoin$ hdfs dfs -put ./DeptName.txt
/khushil_join/
hduser@bmsce-Precision-T1700:~/khushil/join/MapReduceJoin$ hdfs dfs -put ./DeptStrength.txt
/khushil_join/
hduser@bmsce-Precision-T1700:~/khushil/join/MapReduceJoin$ hadoop jar MapReduceJoin.jar
/khushil_join/DeptName.txt /khushil_join/DeptStrength.txt /khushil_join/output/
22/06/27 15:12:24 INFO Configuration.deprecation: session.id is deprecated. Instead, use
dfs.metrics.session-id
22/06/27 15:12:24 INFO jvm.JvmMetrics: Initializing JVM Metrics with processName=JobTracker,
sessionId=
22/06/27 15:12:24 INFO jvm.JvmMetrics: Cannot initialize JVM Metrics with processName=JobTracker,
sessionId= - already initialized
22/06/27 15:12:24 INFO mapred.FileInputFormat: Total input paths to process : 1
22/06/27 15:12:24 INFO mapred.FileInputFormat: Total input paths to process : 1
22/06/27 15:12:24 INFO mapreduce.JobSubmitter: number of splits:2
22/06/27 15:12:24 INFO mapreduce.JobSubmitter: Submitting tokens for job: job_local1238804660_0001
22/06/27 15:12:24 INFO mapreduce.Job: The url to track the job: http://localhost:8080/
22/06/27 15:12:24 INFO mapred.LocalJobRunner: OutputCommitter set in config null
22/06/27 15:12:24 INFO mapreduce.Job: Running job: job_local1238804660_0001
22/06/27 15:12:24 INFO mapred.LocalJobRunner: OutputCommitter is
org.apache.hadoop.mapred.FileOutputCommitter
22/06/27 15:12:24 INFO mapred.LocalJobRunner: Waiting for map tasks
22/06/27 15:12:24 INFO mapred.LocalJobRunner: Starting task: attempt_local1238804660_0001_m_000000_0
22/06/27 15:12:24 INFO mapred.Task: Using ResourceCalculatorProcessTree : [ ]
22/06/27 15:12:24 INFO mapred.MapTask: Processing split:
hdfs://localhost:54310/khushil_join/DeptName.txt:0+59
22/06/27 15:12:24 INFO mapred.MapTask: numReduceTasks: 1
22/06/27 15:12:24 INFO mapred.MapTask: (EQUATOR) 0 kvi 26214396(104857584)
22/06/27 15:12:24 INFO mapred.MapTask: mapreduce.task.io.sort.mb: 100
22/06/27 15:12:24 INFO mapred.MapTask: soft limit at 83886080
22/06/27 15:12:24 INFO mapred.MapTask: bufstart = 0; bufvoid = 104857600
22/06/27 15:12:24 INFO mapred.MapTask: kvstart = 26214396; length = 6553600
22/06/27 15:12:24 INFO mapred.MapTask: Map output collector class =
org.apache.hadoop.mapred.MapTask$MapOutputBuffer
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22/06/27 15:12:24 INFO mapred.MapTask: kvstart = 26214396(104857584); kvend = 26214384(104857536);
length = 13/6553600
22/06/27 15:12:24 INFO mapred.MapTask: Finished spill 0
22/06/27 15:12:24 INFO mapred.Task: Task:attempt_local1238804660_0001_m_000000_0 is done. And is in
the process of committing
22/06/27 15:12:24 INFO mapred.LocalJobRunner: hdfs://localhost:54310/khushil_join/DeptName.txt:0+59
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22/06/27 15:12:24 INFO mapred.MapTask: (EQUATOR) 0 kvi 26214396(104857584)
22/06/27 15:12:24 INFO mapred.MapTask: mapreduce.task.io.sort.mb: 100
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22/06/27 15:12:24 INFO mapred.LocalJobRunner: Finishing task:
attempt_local1238804660_0001_m_000001_0
22/06/27 15:12:24 INFO mapred.LocalJobRunner: map task executor complete.
22/06/27 15:12:24 INFO mapred.LocalJobRunner: Waiting for reduce tasks
22/06/27 15:12:24 INFO mapred.LocalJobRunner: Starting task: attempt_local1238804660_0001_r_000000_0
22/06/27 15:12:24 INFO mapred.Task: Using ResourceCalculatorProcessTree : [ ]
22/06/27 15:12:24 INFO mapred.ReduceTask: Using ShuffleConsumerPlugin:
org.apache.hadoop.mapreduce.task.reduce.Shuffle@45cb1c
22/06/27 15:12:24 INFO reduce.MergeManagerImpl: MergerManager: memoryLimit=334338464,
maxSingleShuffleLimit=83584616, mergeThreshold=220663392, ioSortFactor=10,
memToMemMergeOutputsThreshold=10
22/06/27 15:12:24 INFO reduce.EventFetcher: attempt_local1238804660_0001_r_000000_0 Thread started:
EventFetcher for fetching Map Completion Events
22/06/27 15:12:24 INFO reduce.LocalFetcher: localfetcher#1 about to shuffle output of map
attempt_local1238804660_0001_m_000001_0 decomp: 64 len: 68 to MEMORY
22/06/27 15:12:24 INFO reduce.InMemoryMapOutput: Read 64 bytes from map-output for
attempt_local1238804660_0001_m_000001_0
22/06/27 15:12:24 INFO reduce.MergeManagerImpl: closeInMemoryFile -> map-output of size: 64,
inMemoryMapOutputs.size() -> 1, commitMemory -> 0, usedMemory ->64
22/06/27 15:12:24 INFO reduce.LocalFetcher: localfetcher#1 about to shuffle output of map
attempt_local1238804660_0001_m_000000_0 decomp: 73 len: 77 to MEMORY
22/06/27 15:12:24 INFO reduce.InMemoryMapOutput: Read 73 bytes from map-output for
attempt_local1238804660_0001_m_000000_0
22/06/27 15:12:24 INFO reduce.MergeManagerImpl: closeInMemoryFile -> map-output of size: 73,
inMemoryMapOutputs.size() -> 2, commitMemory -> 64, usedMemory ->137
22/06/27 15:12:24 INFO reduce.EventFetcher: EventFetcher is interrupted.. Returning
22/06/27 15:12:24 INFO mapred.LocalJobRunner: 2 / 2 copied.
22/06/27 15:12:24 INFO reduce.MergeManagerImpl: finalMerge called with 2 in-memory map-outputs and 0
on-disk map-outputs
22/06/27 15:12:24 INFO mapred.Merger: Merging 2 sorted segments
22/06/27 15:12:24 INFO mapred.Merger: Down to the last merge-pass, with 2 segments left of total
size: 121 bytes
22/06/27 15:12:24 INFO reduce.MergeManagerImpl: Merged 2 segments, 137 bytes to disk to satisfy
reduce memory limit
22/06/27 15:12:24 INFO reduce.MergeManagerImpl: Merging 1 files, 139 bytes from disk
22/06/27 15:12:24 INFO reduce.MergeManagerImpl: Merging 0 segments, 0 bytes from memory into reduce
22/06/27 15:12:24 INFO mapred.Merger: Merging 1 sorted segments
22/06/27 15:12:24 INFO mapred.Merger: Down to the last merge-pass, with 1 segments left of total
size: 127 bytes
22/06/27 15:12:24 INFO mapred.LocalJobRunner: 2 / 2 copied.
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22/06/27 15:12:24 INFO mapred.Task: Task:attempt_local1238804660_0001_r_000000_0 is done. And is in the process of committing
22/06/27 15:12:24 INFO mapred.LocalJobRunner: 2 / 2 copied.
22/06/27 15:12:24 INFO mapred.Task: Task attempt_local1238804660_0001_r_000000_0 is allowed to commit now
22/06/27 15:12:24 INFO output.FileOutputCommitter: Saved output of task 'attempt_local1238804660_0001_r_000000_0' to
hdfs://localhost:54310/khushil_join/output/_temporary/0/task_local1238804660_0001_r_000000
22/06/27 15:12:24 INFO mapred.LocalJobRunner: reduce > reduce
22/06/27 15:12:24 INFO mapred.Task: Task 'attempt_local1238804660_0001_r_000000_0' done.
22/06/27 15:12:24 INFO mapred.LocalJobRunner: Finishing task:
attempt_local1238804660_0001_r_000000_0
22/06/27 15:12:24 INFO mapred.LocalJobRunner: reduce task executor complete.
22/06/27 15:12:25 INFO mapreduce.Job: Job job_local1238804660_0001 running in uber mode : false
22/06/27 15:12:25 INFO mapreduce.Job: map 100% reduce 100%
22/06/27 15:12:25 INFO mapreduce.Job: Job job_local1238804660_0001 completed successfully
22/06/27 15:12:25 INFO mapreduce.Job: Counters: 38

File System Counters
FILE: Number of bytes read=26370
FILE: Number of bytes written=782865
FILE: Number of read operations=0
FILE: Number of large read operations=0
FILE: Number of write operations=0
HDFS: Number of bytes read=277
HDFS: Number of bytes written=85
HDFS: Number of read operations=28
HDFS: Number of large read operations=0
HDFS: Number of write operations=5

Map-Reduce Framework
Map input records=8
Map output records=8
Map output bytes=117
Map output materialized bytes=145
Input split bytes=443
Combine input records=0
Combine output records=0
Reduce input groups=4
Reduce shuffle bytes=145
Reduce input records=8
Reduce output records=4
Spilled Records=16
Shuffled Maps =2
Failed Shuffles=0
Merged Map outputs=2
GC time elapsed (ms)=2
CPU time spent (ms)=0
Physical memory (bytes) snapshot=0
Virtual memory (bytes) snapshot=0
Total committed heap usage (bytes)=916979712

Shuffle Errors
BAD_ID=0
CONNECTION=0
IO_ERROR=0
WRONG_LENGTH=0
WRONG_MAP=0
WRONG_REDUCE=0

File Input Format Counters
Bytes Read=0

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File Output Format Counters
Bytes Written=85
hduser@bmsce-Precision-T1700:~/khushil/join/MapReduceJoin$ hdfs dfs -ls /khushil_join/output/
Found 2 items
-rw-r--r--  1 hduser supergroup          0 2022-06-27 15:12 /khushil_join/output/_SUCCESS
-rw-r--r--  1 hduser supergroup        85 2022-06-27 15:12 /khushil_join/output/part-00000
hduser@bmsce-Precision-T1700:~/khushil/join/MapReduceJoin$ hdfs dfs -cat /khushil_join/output/part-00000
A11      Finance           50
B12      HR                100
C13      Manufacturing     250
Dept_ID  Dept_Name           Total_Employee
hduser@bmsce-Precision-T1700:~/khushil/join/MapReduceJoin$ hadoop jar MapReduceJoin.jar
/khushil_join/DeptStrength.txt /khushil_join/DeptName.txt /khushil_join/output/
22/06/27 15:15:17 INFO Configuration.deprecation: session.id is deprecated. Instead, use
dfs.metrics.session-id
22/06/27 15:15:17 INFO jvm.JvmMetrics: Initializing JVM Metrics with processName=JobTracker,
sessionId=
22/06/27 15:15:17 INFO jvm.JvmMetrics: Cannot initialize JVM Metrics with processName=JobTracker,
sessionId= - already initialized
Exception in thread "main" org.apache.hadoop.mapred.FileAlreadyExistsException: Output directory
hdfs://localhost:54310/khushil_join/output already exists
    at org.apache.hadoop.mapred.FileOutputFormat.checkOutputSpecs(FileOutputFormat.java:132)
    at org.apache.hadoop.mapreduce.JobSubmitter.checkSpecs(JobSubmitter.java:564)
    at org.apache.hadoop.mapreduce.JobSubmitter.submitJobInternal(JobSubmitter.java:432)
    at org.apache.hadoop.mapreduce.Job$10.run(Job.java:1296)
    at org.apache.hadoop.mapreduce.Job$10.run(Job.java:1293)
    at java.security.AccessController.doPrivileged(Native Method)
    at javax.security.auth.Subject.doAs(Subject.java:422)
    at org.apache.hadoop.security.UserGroupInformation.doAs(UserGroupInformation.java:1628)
    at org.apache.hadoop.mapreduce.Job.submit(Job.java:1293)
    at org.apache.hadoop.mapred.JobClient$1.run(JobClient.java:562)
    at org.apache.hadoop.mapred.JobClient$1.run(JobClient.java:557)
    at java.security.AccessController.doPrivileged(Native Method)
    at javax.security.auth.Subject.doAs(Subject.java:422)
    at org.apache.hadoop.security.UserGroupInformation.doAs(UserGroupInformation.java:1628)
    at org.apache.hadoop.mapred.JobClient.submitJobInternal(JobClient.java:557)
    at org.apache.hadoop.mapred.JobClient.submitJob(JobClient.java:548)
    at org.apache.hadoop.mapred.JobClient.runJob(JobClient.java:833)
    at MapReduceJoin.JoinDriver.run(JoinDriver.java:53)
    at org.apache.hadoop.util.ToolRunner.run(ToolRunner.java:70)
    at org.apache.hadoop.util.ToolRunner.run(ToolRunner.java:84)
    at MapReduceJoin.JoinDriver.main(JoinDriver.java:60)
    at sun.reflect.NativeMethodAccessorImpl.invoke0(Native Method)
    at sun.reflect.NativeMethodAccessorImpl.invoke(NativeMethodAccessorImpl.java:62)
    at sun.reflect.DelegatingMethodAccessorImpl.invoke(DelegatingMethodAccessorImpl.java:43)
    at java.lang.reflect.Method.invoke(Method.java:498)
    at org.apache.hadoop.util.RunJar.run(RunJar.java:221)
    at org.apache.hadoop.util.RunJar.main(RunJar.java:136)
hduser@bmsce-Precision-T1700:~/khushil/join/MapReduceJoin$ hadoop jar MapReduceJoin.jar
/khushil_join/DeptStrength.txt /khushil_join/DeptName.txt /khushil_join/output2/
22/06/27 15:15:26 INFO Configuration.deprecation: session.id is deprecated. Instead, use
dfs.metrics.session-id
22/06/27 15:15:26 INFO jvm.JvmMetrics: Initializing JVM Metrics with processName=JobTracker,
sessionId=
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22/06/27 15:15:26 INFO mapred.FileInputFormat: Total input paths to process : 1

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22/06/27 15:15:26 INFO mapred.FileInputFormat: Total input paths to process : 1
22/06/27 15:15:26 INFO mapreduce.JobSubmitter: number of splits:2
22/06/27 15:15:26 INFO mapreduce.JobSubmitter: Submitting tokens for job: job_local1698947086_0001
22/06/27 15:15:26 INFO mapreduce.Job: The url to track the job: http://localhost:8080/
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22/06/27 15:15:26 INFO mapred.LocalJobRunner: Starting task: attempt_local1698947086_0001_m_000000_0
22/06/27 15:15:26 INFO mapred.Task: Using ResourceCalculatorProcessTree : [ ]
22/06/27 15:15:26 INFO mapred.MapTask: Processing split:
hdfs://localhost:54310/khushil_join/DeptName.txt:0+59
22/06/27 15:15:26 INFO mapred.MapTask: numReduceTasks: 1
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22/06/27 15:15:26 INFO mapred.MapTask: Starting flush of map output
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length = 13/6553600
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22/06/27 15:15:27 INFO mapred.Task: Using ResourceCalculatorProcessTree : [ ]
22/06/27 15:15:27 INFO mapred.ReduceTask: Using ShuffleConsumerPlugin:
org.apache.hadoop.mapreduce.task.reduce.Shuffle@477ec0d7
22/06/27 15:15:27 INFO reduce.MergeManagerImpl: MergerManager: memoryLimit=334338464,
maxSingleShuffleLimit=83584616, mergeThreshold=220663392, ioSortFactor=10,
memToMemMergeOutputsThreshold=10
22/06/27 15:15:27 INFO reduce.EventFetcher: attempt_local1698947086_0001_r_000000_0 Thread started:
EventFetcher for fetching Map Completion Events
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attempt_local1698947086_0001_m_000000_0 decomp: 73 len: 77 to MEMORY
22/06/27 15:15:27 INFO reduce.InMemoryMapOutput: Read 73 bytes from map-output for
attempt_local1698947086_0001_m_000000_0
22/06/27 15:15:27 INFO reduce.MergeManagerImpl: closeInMemoryFile -> map-output of size: 73,
inMemoryMapOutputs.size() -> 1, commitMemory -> 0, usedMemory ->73
22/06/27 15:15:27 INFO reduce.LocalFetcher: localfetcher#1 about to shuffle output of map
attempt_local1698947086_0001_m_000001_0 decomp: 64 len: 68 to MEMORY
22/06/27 15:15:27 INFO reduce.InMemoryMapOutput: Read 64 bytes from map-output for
attempt_local1698947086_0001_m_000001_0
22/06/27 15:15:27 INFO reduce.MergeManagerImpl: closeInMemoryFile -> map-output of size: 64,
inMemoryMapOutputs.size() -> 2, commitMemory -> 73, usedMemory ->137
22/06/27 15:15:27 INFO reduce.EventFetcher: EventFetcher is interrupted.. Returning
22/06/27 15:15:27 INFO mapred.LocalJobRunner: 2 / 2 copied.
22/06/27 15:15:27 INFO reduce.MergeManagerImpl: finalMerge called with 2 in-memory map-outputs and 0
on-disk map-outputs
22/06/27 15:15:27 INFO mapred.Merger: Merging 2 sorted segments
22/06/27 15:15:27 INFO mapred.Merger: Down to the last merge-pass, with 2 segments left of total
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commit now
22/06/27 15:15:27 INFO output.FileOutputCommitter: Saved output of task
'attempt_local1698947086_0001_r_000000_0' to
hdfs://localhost:54310/khushil_join/output2/_temporary/0/task_local1698947086_0001_r_000000
22/06/27 15:15:27 INFO mapred.LocalJobRunner: reduce > reduce
22/06/27 15:15:27 INFO mapred.Task: Task 'attempt_local1698947086_0001_r_000000_0' done.
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attempt_local1698947086_0001_r_000000_0
22/06/27 15:15:27 INFO mapred.LocalJobRunner: reduce task executor complete.
22/06/27 15:15:27 INFO mapreduce.Job: Job job_local1698947086_0001 running in uber mode : false
22/06/27 15:15:27 INFO mapreduce.Job: map 100% reduce 100%
22/06/27 15:15:27 INFO mapreduce.Job: Job job_local1698947086_0001 completed successfully
22/06/27 15:15:27 INFO mapreduce.Job: Counters: 38
File System Counters
```

FILE: Number of bytes read=26370
FILE: Number of bytes written=782871
FILE: Number of read operations=0
FILE: Number of large read operations=0
FILE: Number of write operations=0
HDFS: Number of bytes read=277
HDFS: Number of bytes written=85
HDFS: Number of read operations=28
HDFS: Number of large read operations=0
HDFS: Number of write operations=5
Map-Reduce Framework
Map input records=8
Map output records=8
Map output bytes=117
Map output materialized bytes=145
Input split bytes=443
Combine input records=0
Combine output records=0
Reduce input groups=4
Reduce shuffle bytes=145
Reduce input records=8
Reduce output records=4
Spilled Records=16
Shuffled Maps =2
Failed Shuffles=0
Merged Map outputs=2
GC time elapsed (ms)=2
CPU time spent (ms)=0
Physical memory (bytes) snapshot=0
Virtual memory (bytes) snapshot=0
Total committed heap usage (bytes)=913833984
Shuffle Errors
BAD_ID=0
CONNECTION=0
IO_ERROR=0
WRONG_LENGTH=0
WRONG_MAP=0
WRONG_REDUCE=0
File Input Format Counters
Bytes Read=0
File Output Format Counters
Bytes Written=85

```
hduser@bmsce-Precision-T1700:~/khushil/join/MapReduceJoin$ hdfs dfs -cat /khushil_join/output2/part-00000
```

| | | |
|-----|-----|---------------|
| A11 | 50 | Finance |
| B12 | 100 | HR |
| C13 | 250 | Manufacturing |

| Dept_ID | Total_Employee | Dept_Name |
|---------|----------------|-----------|
|---------|----------------|-----------|

```
hduser@bmsce-Precision-T1700:~/khushil/join/MapReduceJoin$
```