EX:NO:05	SALES COUNT PROGRAM USING MAPREDUCE
DATE:	

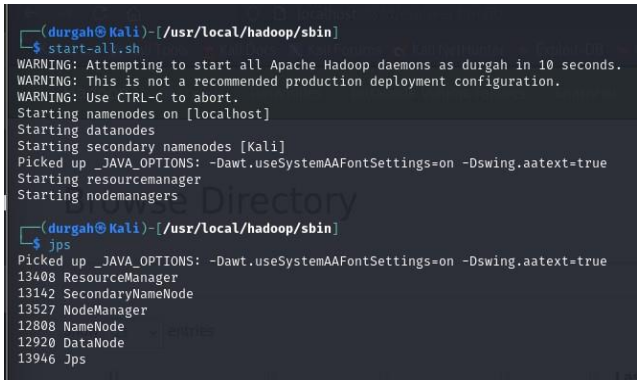
AIM:

To implement a MapReduce program in Hadoop to count sales records per country from a given dataset.

PROCEDURE:

Step 1:

Before running the MapReduce program, start the necessary Hadoop services.



Step 2: Prepare the Sales Data (Input File)

Create a text file named sales.txt containing sales records. Each row represents a sale with fields like date, product, cost, payment type, country.

Example Content (sales.txt):

2024-04-01,TV,1000,Credit Card,USA

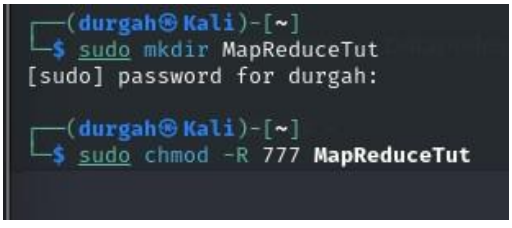
2024-04-01,Phone,800,Debit Card,India

2024-04-01,Laptop,1200,Cash,India

2024-04-01,Tablet,500,Credit Card,Canada

2024-04-01,Camera,700,Cash,USA

Step 3: Upload Date to HDFS



- hdfs dfs -mkdir /mapreduce_input_sales
  - The first command creates a directory in HDFS
- hdfs dfs -put sales.txt /mapreduce_input_sales/
  - The second command uploads the sales data file.

Step 4: Write the MapReduce Code
Mapper Code (SalesMapper.java)

```
import java.io.IOException;
import org.apache.hadoop.io.IntWritable;
import org.apache.hadoop.io.Text;
import org.apache.hadoop.mapreduce.Mapper;
public class SalesMapper extends Mapper<Object, Text, Text, IntWritable> {
   private final static IntWritable one = new IntWritable(1);
   private Text country = new Text();
   public void map(Object key, Text value, Context context) throws IOException,
InterruptedException {
      String[] fields = value.toString().split(",");
      if (fields.length == 5) {  // Ensure correct format
         country.set(fields[4].trim());  // Extract country
         context.write(country, one);    // Emit (Country, 1)
      }
   }
}
```

Reducer Code (SalesReducer.java)

```
import java.io.IOException;
import java.util.Iterator;
import org.apache.hadoop.io.IntWritable;
import org.apache.hadoop.io.Text;
import org.apache.hadoop.mapreduce.Reducer;
public class SalesReducer extends Reducer<Text, IntWritable, Text, IntWritable> {
   public void reduce(Text key, Iterable<IntWritable> values, Context context) throws IOException,
InterruptedException {
      int sum = 0;
      for (IntWritable val : values) {
         sum += val.get();
      }
      context.write(key, new IntWritable(sum));
   }
}
```

Driver Code (SalesDriver.java)

```
import org.apache.hadoop.conf.Configuration;
import org.apache.hadoop.fs.Path;
import org.apache.hadoop.io.IntWritable;
import org.apache.hadoop.io.Text;
import org.apache.hadoop.mapreduce.Job;
import org.apache.hadoop.mapreduce.lib.input.FileInputFormat;
import org.apache.hadoop.mapreduce.lib.output.FileOutputFormat;
public class SalesDriver {
   public static void main(String[] args) throws Exception {
      Configuration conf = new Configuration();
```

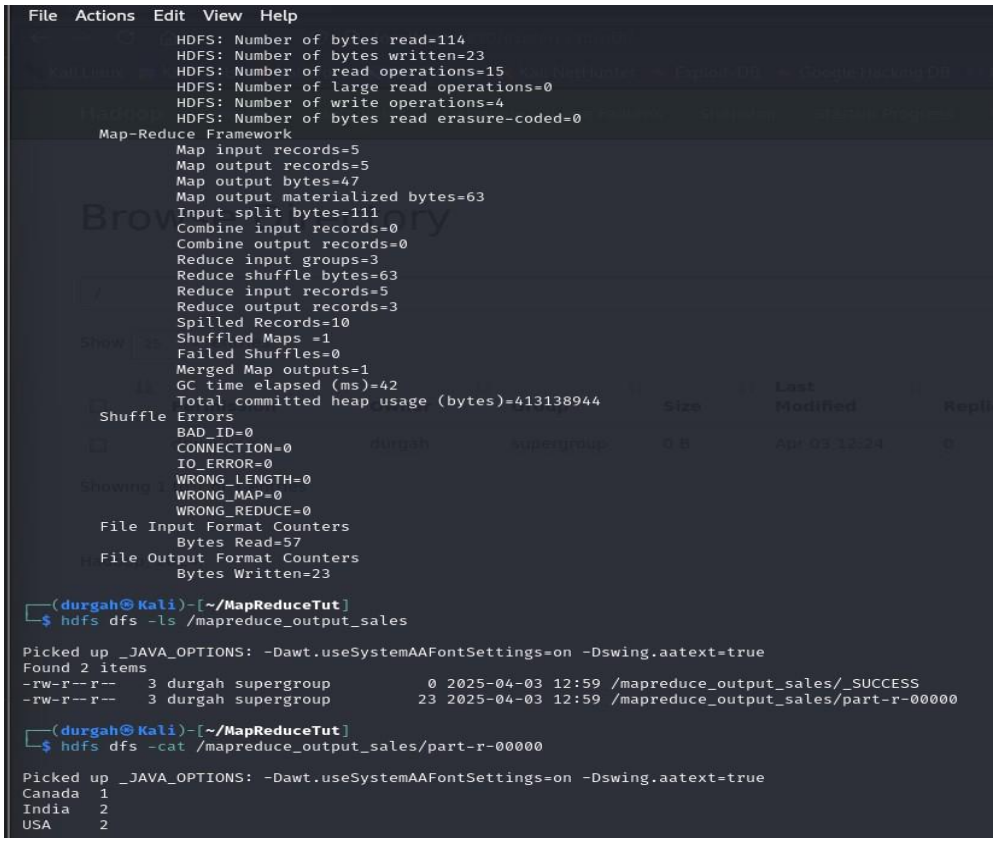
```
        Job job = Job.getInstance(conf, "Sales Count");

        job.setJarByClass(SalesDriver.class);
        job.setMapperClass(SalesMapper.class);
        job.setReducerClass(SalesReducer.class);
        job.setOutputKeyClass(Text.class);
        job.setOutputValueClass(IntWritable.class);
        FileInputFormat.addInputPath(job, new Path(args[0]));
        FileOutputFormat.setOutputPath(job, new Path(args[1]));
        System.exit(job.waitForCompletion(true) ? 0 : 1);
    }
}
```

Step 5: Compile and Create a JAR File

```
┌──(durgah㉿Kali)-[/usr/local/hadoop/sbin]
└─$ hadoop jar ProductSalePerCountry.jar SalesCountry.SalesCountryDriver /inputMapReduce /mapreduce_output_sales

Picked up _JAVA_OPTIONS: -Dawt.useSystemAAFontSettings=on -Dswing.aatext=true
JAR does not exist or is not a normal file: /usr/local/hadoop/sbin/ProductSalePerCountry.jar

┌──(durgah㉿Kali)-[/usr/local/hadoop/sbin]
└─$ ls -lh ProductSalePerCountry.jar

ls: cannot access 'ProductSalePerCountry.jar': No such file or directory

┌──(durgah㉿Kali)-[/usr/local/hadoop/sbin]
└─$ cd ~/MapReduceTut


┌──(durgah㉿Kali)-[~/MapReduceTut]
└─$ hadoop com.sun.tools.javac.Main SalesCountryDriver.java SalesMapper.java SalesCountryReducer.java

Picked up _JAVA_OPTIONS: -Dawt.useSystemAAFontSettings=on -Dswing.aatext=true

┌──(durgah㉿Kali)-[~/MapReduceTut]
└─$ jar -cvf ProductSalePerCountry.jar *.class

Picked up _JAVA_OPTIONS: -Dawt.useSystemAAFontSettings=on -Dswing.aatext=true
added manifest
adding: SalesCountryDriver.class(in = 1374) (out= 749)(deflated 45%)
adding: SalesCountryReducer.class(in = 1605) (out= 669)(deflated 58%)
adding: SalesMapper.class(in = 1691) (out= 701)(deflated 58%)
```

```
┌──(durgah㉿Kali)-[~/MapReduceTut]
└─$ hadoop jar ProductSalePerCountry.jar SalesCountryDriver /inputMapReduce /mapreduce_output_sales

Picked up _JAVA_OPTIONS: -Dawt.useSystemAAFontSettings=on -Dswing.aatext=true
2025-04-03 12:58:58,303 INFO impl.MetricsConfig: Loaded properties from hadoop-metrics2.properties
2025-04-03 12:58:58,418 INFO impl.MetricsSystemImpl: Scheduled Metric snapshot period at 10 second(s).
2025-04-03 12:58:58,419 INFO impl.MetricsSystemImpl: JobTracker metrics system started
2025-04-03 12:58:58,574 WARN mapreduce.JobResourceUploader: Hadoop command-line option parsing not performed. Imple
ment the Tool interface and execute your application with ToolRunner to remedy this.
2025-04-03 12:58:58,940 INFO input.FileInputFormat: Total input files to process : 1
2025-04-03 12:58:58,984 INFO mapreduce.JobSubmitter: number of splits:1
2025-04-03 12:58:59,217 INFO mapreduce.JobSubmitter: Submitting tokens for job: job_local1559068103_0001
2025-04-03 12:58:59,217 INFO mapreduce.JobSubmitter: Executing with tokens: []
2025-04-03 12:58:59,371 INFO mapreduce.Job: The url to track the job: http://localhost:8080/
2025-04-03 12:58:59,372 INFO mapreduce.Job: Running job: job_local1559068103_0001
2025-04-03 12:58:59,458 INFO mapred.LocalJobRunner: OutputCommitter set in config null
2025-04-03 12:58:59,494 INFO output.PathOutputCommitterFactory: No output committer factory defined, defaulting to
FileOutputCommitterFactory
2025-04-03 12:58:59,496 INFO output.FileOutputCommitter: File Output Committer Algorithm version is 2
2025-04-03 12:58:59,497 INFO output.FileOutputCommitter: FileOutputCommitter skip cleanup _temporary folders under
output directory:false, ignore cleanup failures: false
2025-04-03 12:58:59,501 INFO mapred.LocalJobRunner: OutputCommitter is org.apache.hadoop.mapreduce.lib.output.FileO
utputCommitter
2025-04-03 12:58:59,604 INFO mapred.LocalJobRunner: Waiting for map tasks
2025-04-03 12:58:59,605 INFO mapred.LocalJobRunner: Starting task: attempt_local1559068103_0001_m_000000_0
2025-04-03 12:58:59,651 INFO output.PathOutputCommitterFactory: No output committer factory defined, defaulting to
FileOutputCommitterFactory
2025-04-03 12:58:59,655 INFO output.FileOutputCommitter: File Output Committer Algorithm version is 2
2025-04-03 12:58:59,659 INFO output.FileOutputCommitter: FileOutputCommitter skip cleanup _temporary folders under
output directory:false, ignore cleanup failures: false
2025-04-03 12:58:59,698 INFO mapred.Task:  Using ResourceCalculatorProcessTree : [ ]
2025-04-03 12:58:59,712 INFO mapred.MapTask: Processing split: hdfs://localhost:9000/inputMapReduce/sales.csv:0+57
2025-04-03 12:58:59,825 INFO mapred.MapTask: (EQUATOR) 0 kvi 26214396(104857584)
2025-04-03 12:58:59,825 INFO mapred.MapTask: mapreduce.task.io.sort.mb: 100
2025-04-03 12:58:59,825 INFO mapred.MapTask: soft limit at 83886080
2025-04-03 12:58:59,825 INFO mapred.MapTask: bufstart = 0; bufvoid = 104857600
2025-04-03 12:58:59,825 INFO mapred.MapTask: kvstart = 26214396; length = 6553600
2025-04-03 12:58:59,860 INFO mapred.MapTask: Map output collector class = org.apache.hadoop.mapred.MapTask$MapOutpu
tBuffer
2025-04-03 12:59:00,401 INFO mapreduce.Job: Job job_local1559068103_0001 running in uber mode : false
2025-04-03 12:59:00,408 INFO mapreduce.Job:  map 0% reduce 0%
2025-04-03 12:59:00,518 INFO mapred.LocalJobRunner:
2025-04-03 12:59:00,528 INFO mapred.MapTask: Starting flush of map output
2025-04-03 12:59:00,529 INFO mapred.MapTask: Spilling map output
2025-04-03 12:59:00,529 INFO mapred.MapTask: bufstart = 0; bufend = 47; bufvoid = 104857600
2025-04-03 12:59:00,529 INFO mapred.MapTask: kvstart = 26214396(104857584); kvend = 26214380(104857520); length = 1
7/6553600
2025-04-03 12:59:00,573 INFO mapred.MapTask: Finished spill 0
2025-04-03 12:59:00,636 INFO mapred.Task: Task:attempt_local1559068103_0001_m_000000_0 is done. And is in the proce
ss of committing
2025-04-03 12:59:00,657 INFO mapred.LocalJobRunner: map
```

Step 6: Run the MapReduce Job and Verify the output



RESULT:

Thus,the implementation of MapReduce program in Hadoop to count sales records per country from a given dataset is done successfully.