Session 4: MR -INTRODUCTION

Assignment 4

Task 1:

Write a Map Reduce program to filter out the invalid records. Map only job will fit for this context.

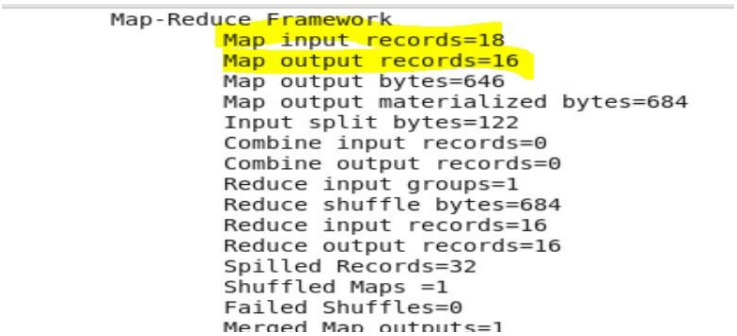
Code:

```
package task1_Assignment5;


import java.io.IOException;
import org.apache.hadoop.conf.Configuration;
import org.apache.hadoop.fs.Path;
import org.apache.hadoop.io.NullWritable;
import org.apache.hadoop.io.Text;
import org.apache.hadoop.mapreduce.Job;
import org.apache.hadoop.mapreduce.Mapper;
import org.apache.hadoop.mapreduce.lib.input.FileInputFormat;
import org.apache.hadoop.mapreduce.lib.output.FileOutputFormat;


public class FilterInvalidRecords {


   public static void main(String[] args) throws Exception {
```

```
    Configuration conf = new Configuration();
    Job job = new Job(conf, "FilterInvalidRecords");
    job.setJarByClass(FilterInvalidRecords.class);
    job.setMapperClass(FilterInvalidRecordsMapper.class);
    job.setOutputKeyClass(NullWritable.class);
    job.setOutputValueClass(Text.class);
    FileInputFormat.addInputPath(job, new Path(args[0]));
    FileOutputFormat.setOutputPath(job, new Path(args[1]));
    System.exit(job.waitForCompletion(true) ? 0 : 1);
  }
  public static class FilterInvalidRecordsMapper extends
      Mapper<Object, Text, NullWritable, Text> {
    public void map(Object key, Text value, Context context) throws IOException,
InterruptedException {
    String[] parts = value.toString().split("[|]");
    Text company = new Text(parts[0]);
    Text product = new Text(parts[1]);
    if (parts.length == 6 && !(company.toString().matches("NA") ||
product.toString().matches("NA"))) {
    context.write(NullWritable.get(), value);
    }
  }}
}
```

Output:

There were 2 invalid records out of 18 total records in the given dataset, which can be seen in the job output as shown below:



```
You have new mail in /var/spool/mail/acadgild
[acadgild@localhost ~]$ hadoop fs -cat /user/acadgild/
rt-r-00000
18/12/14 23:47:13 WARN util.NativeCodeLoader: Unable t
ry for your platform... using builtin-java classes whe
Samsung|Super|14|Maharashtra|619082|9200
Samsung|Super|14|Maharashtra|619082|9200
Samsung|Super|14|Maharashtra|619082|9200
Lava|Attention|20|Assam|454601|24200
Samsung|Decent|16|Kerala|922401|12200
Samsung|Optima|14|Madhya Pradesh|132401|14200
Zen|Super|14|Maharashtra|619082|9200
Lava|Attention|20|Assam|454601|24200
Onida|Decent|14|Uttar Pradesh|232401|16200
Onida|Lucid|18|Uttar Pradesh|232401|16200
Samsung|Optima|14|Madhya Pradesh|132401|14200
Zen|Super|14|Maharashtra|619082|9200
Lava|Attention|20|Assam|454601|24200
Akai|Decent|16|Kerala|922401|12200
Onida|Lucid|18|Uttar Pradesh|232401|16200
Samsung|Optima|14|Madhya Pradesh|132401|14200
[acadgild@localhost ~]$
```

Task 2:

Write a Map Reduce program to calculate the total units sold for each Company.

Code written to execute the task:

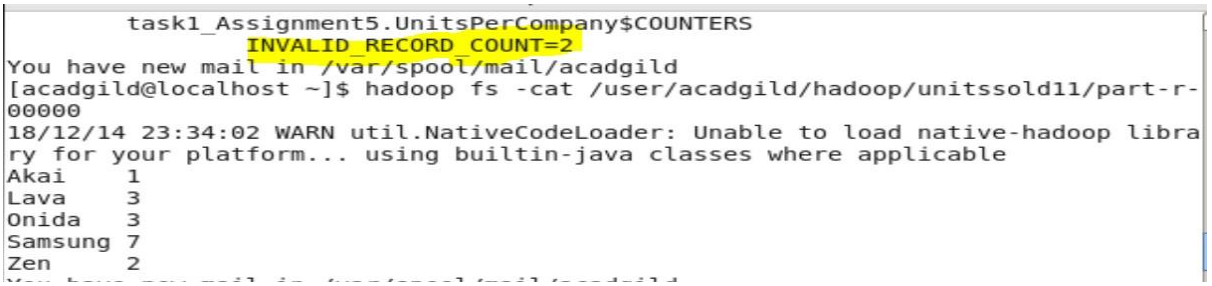
```
package task1_Assignment5;

import java.io.IOException;
import java.util.HashSet;
import java.util.Set;

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.Mapper;
import org.apache.hadoop.mapreduce.Reducer;
import org.apache.hadoop.mapreduce.lib.input.FileInputFormat;
import org.apache.hadoop.mapreduce.lib.output.FileOutputFormat;

public class UnitsPerCompany {

   private enum COUNTERS {
      INVALID_RECORD_COUNT
   }

   public static void main(String[] args) throws Exception {
      Configuration conf = new Configuration();

      Job job = new Job(conf, "Units sold per company");
      job.setJarByClass(UnitsPerCompany.class);
```

```
        job.setMapperClass(UnitsPerCompanyMapper.class);
        job.setReducerClass(UnitsPerCompanyReducer.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);
        org.apache.hadoop.mapreduce.Counters counters = job.getCounters();
        System.out.println("No. of Invalid Records :"
                + counters.findCounter(COUNTERS.INVALID_RECORD_COUNT)
                        .getValue());
    }

    public static class UnitsPerCompanyReducer extends
            Reducer< Text,IntWritable, Text, IntWritable> {

        public void reduce( Text company,
                Iterable<IntWritable> counts,
                Reducer<Text,IntWritable, Text, IntWritable>.Context context)
                throws IOException, InterruptedException {

            if(!(company.toString()).matches("NA")) {
            int i=0;
            for (IntWritable count : counts) {
                i+=count.get();
            }
            IntWritable size = new IntWritable(i);
            context.write(company, size);
        }
        }
    }

    public static class UnitsPerCompanyMapper extends
            Mapper<Object, Text,Text, IntWritable> {

        public void map(Object key, Text value,
                Mapper<Object, Text, Text,IntWritable>.Context context)
                throws IOException, InterruptedException {

            String[] parts = value.toString().split("[|]");
            Text company = new Text(parts[0]);
            Text product = new Text(parts[1]);
            IntWritable one = new IntWritable(1);
            if (parts.length == 6 && !(company.toString().matches("NA") ||
product.toString().matches("NA"))) {
                context.write(company,one);
            } else {
                // add counter for invalid records
                context.getCounter(COUNTERS.INVALID_RECORD_COUNT).increment(1L);
            }
```

```
    }
  }

}
```

Output:

The output shows the units sold per company in different states, which sums to 16 as 2 records are invalid.



Task 3:

Write a Map Reduce program to calculate the total units sold in each state for Onida company.

Code written to execute the task:

```
package task1_Assignment5;


import java.io.IOException;


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.Mapper;

import org.apache.hadoop.mapreduce.Reducer;

import org.apache.hadoop.mapreduce.lib.input.FileInputFormat;

import org.apache.hadoop.mapreduce.lib.output.FileOutputFormat;
```

```
public class Onidaperstate {


   private enum COUNTERS {
      INVALID_RECORD_COUNT
   }

   public static void main(String[] args) throws Exception {
      Configuration conf = new Configuration();


      Job job = new Job(conf, "Units sold per company");
      job.setJarByClass(Onidaperstate.class);
      job.setMapperClass(OnidaperstateMapper.class);
      job.setReducerClass(OnidaperstateReducer.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);
      org.apache.hadoop.mapreduce.Counters counters = job.getCounters();
      System.out.println("No. of Invalid Records :"
            + counters.findCounter(COUNTERS.INVALID_RECORD_COUNT)
                  .getValue());
   }

   public static class OnidaperstateReducer extends
         Reducer< Text,IntWritable, Text, IntWritable> {

      public void reduce(
            Text state,
```

```
            Iterable<IntWritable> units,
            Reducer<Text,IntWritable, Text, IntWritable>.Context context)
            throws IOException, InterruptedException {


        int i=0;
        for (IntWritable unit : units) {
            i+=unit.get();
        }
        IntWritable size = new IntWritable(i);
        context.write(state, size);

      }


}
   public static class OnidaperstateMapper extends
   Mapper<Object, Text,Text, IntWritable> {

public void map(Object key, Text value,
      Mapper<Object, Text, Text,IntWritable>.Context context)
      throws IOException, InterruptedException {

   String[] parts = value.toString().split("[|]");
   Text company = new Text(parts[0]);
   Text product = new Text(parts[1]);
   Text state = new Text(parts[3]);
   IntWritable one = new IntWritable(1);
   if (parts.length == 6
      && !(company.toString().matches("NA") || product.toString().matches("NA"))
      && company.toString().matches("Onida")) {
```

```
        context.write(state,one);
    } else {
        // add counter for invalid records
        context.getCounter(COUNTERS.INVALID_RECORD_COUNT).increment(1L);
    }


}
}


}
```

Output:

```
-r-00000
18/12/14 23:30:40 WARN util.NativeCodeLoader: Unable to load nativ
ry for your platform... using builtin-java classes where applicabl
Uttar Pradesh   3
[acadgild@localhost ~]$ hadoop fs -ls /user/acadgild/hadoop/
```