Lab 6 Average and Mean Max Temperature

a)Average Temperature Code:

Average Driver Code:

```
package avg;
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 AvgDriver {
   public static void main(String[] args) throws Exception {
      if (args.length != 2) {
         System.err.println("Usage: AvgDriver <input path> <output path>");
         System.exit(-1);
      }
      Job job = new Job();
      job.setJarByClass(AvgDriver.class);
      job.setJobName("Average Calculator");
      FileInputFormat.addInputPath(job, new Path(args[0]));
      FileOutputFormat.setOutputPath(job, new Path(args[1]));
      job.setMapperClass(AvgMapper.class);
      job.setReducerClass(AvgReducer.class);
      job.setOutputKeyClass(Text.class);
      job.setOutputValueClass(IntWritable.class);
      System.exit(job.waitForCompletion(true) ? 0 : 1);
   }
}
```

Average Mapper Code:

```
package avg;
import java.io.IOException;
import org.apache.hadoop.io.IntWritable;
import org.apache.hadoop.io.LongWritable;
import org.apache.hadoop.io.Text;
import org.apache.hadoop.mapreduce.Mapper;

public class AvgMapper extends Mapper<LongWritable, Text, Text, IntWritable> {
   public void map(LongWritable key, Text value, Context context) throws IOException,
InterruptedException {
```

```
        String[] fields = value.toString().split(",");
        if (fields.length > 1) {
            String category = fields[0];
            try {
                int number = Integer.parseInt(fields[1]);
                context.write(new Text(category), new IntWritable(number));
            } catch (NumberFormatException e) {
                // Skip if parsing fails
            }
        }
    }
}
```

Average Reducer Code:

```
package avg;
import java.io.IOException;
import org.apache.hadoop.io.IntWritable;
import org.apache.hadoop.io.Text;
import org.apache.hadoop.mapreduce.Reducer;

public class AvgReducer extends Reducer<Text, IntWritable, Text, IntWritable> {
    public void reduce(Text key, Iterable<IntWritable> values, Context context) throws
IOException, InterruptedException {
        int total = 0;
        int count = 0;
        for (IntWritable val : values) {
            total += val.get();
            count++;
        }
        int average = count == 0 ? 0 : total / count;
        context.write(key, new IntWritable(average));
    }
}
```

b)MeanMax Temperature:

MeanMax Driver Code:

```
package meanmax;
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 MeanMaxDriver {
   public static void main(String[] args) throws Exception {
      if (args.length != 2) {
         System.err.println("Please Enter the input and output parameters");
         System.exit(-1);
      }
      Job job = new Job();
      job.setJarByClass(MeanMaxDriver.class);
      job.setJobName("Max temperature");
      FileInputFormat.addInputPath(job, new Path(args[0]));
      FileOutputFormat.setOutputPath(job, new Path(args[1]));
      job.setMapperClass(MeanMaxMapper.class);
      job.setReducerClass(MeanMaxReducer.class);
      job.setOutputKeyClass(Text.class);
      job.setOutputValueClass(IntWritable.class);
      System.exit(job.waitForCompletion(true) ? 0 : 1);
   }
}
```

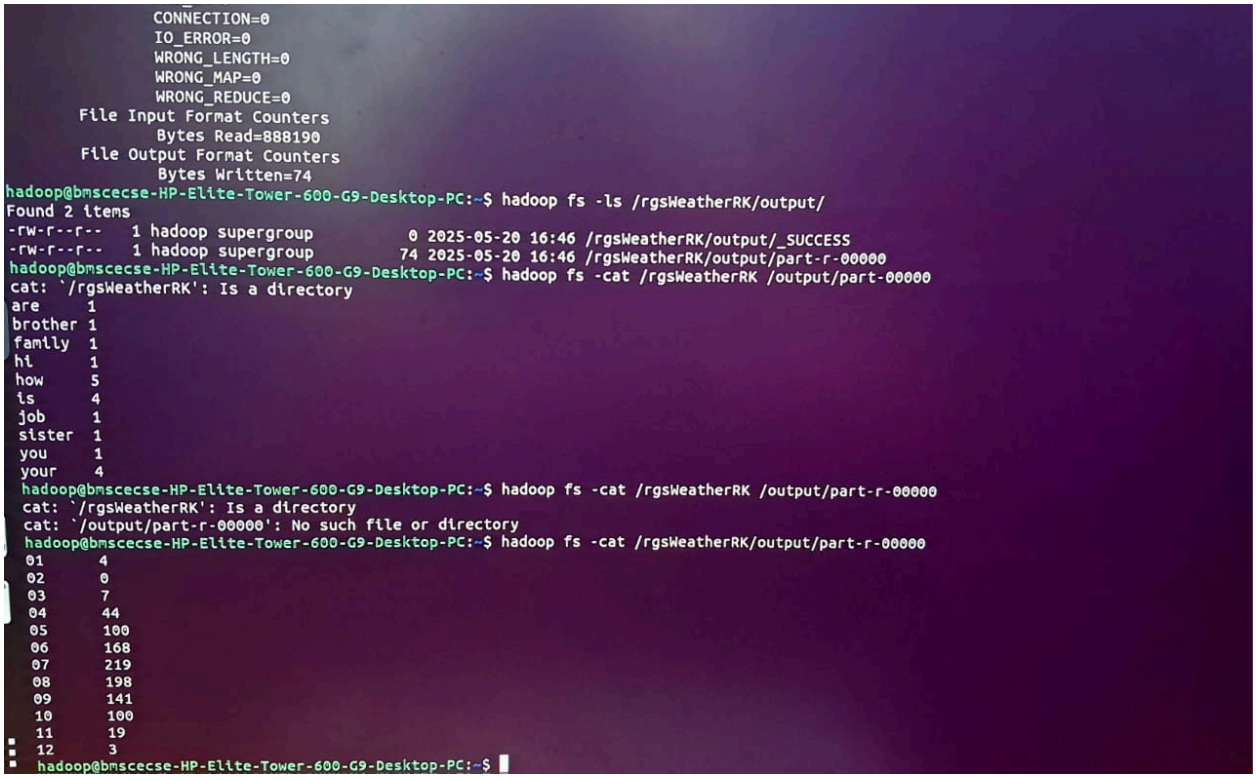
MeanMax Mapper Code:

```
package meanmax;
import java.io.IOException;
import org.apache.hadoop.io.IntWritable;
import org.apache.hadoop.io.LongWritable;
import org.apache.hadoop.io.Text;
import org.apache.hadoop.mapreduce.Mapper;

public class MeanMaxMapper extends Mapper<LongWritable, Text, Text, IntWritable> {
   public static final int MISSING = 9999;

   public void map(LongWritable key, Text value, Context context) throws IOException,
InterruptedException {
      int temperature;
      String line = value.toString();
      String month = line.substring(19, 21);
      if (line.charAt(87) == '+') {
```

```
            temperature = Integer.parseInt(line.substring(88, 92));
        } else {
            temperature = Integer.parseInt(line.substring(87, 92));
        }
        String quality = line.substring(92, 93);
        if (temperature != 9999 && quality.matches("[01459]")) {
            context.write(new Text(month), new IntWritable(temperature));
        }
    }
}
```

MeanMax Reducer Code:

```
package meanmax;
import java.io.IOException;
import org.apache.hadoop.io.IntWritable;
import org.apache.hadoop.io.Text;
import org.apache.hadoop.mapreduce.Reducer;

public class MeanMaxReducer extends Reducer<Text, IntWritable, Text, IntWritable> {
    public void reduce(Text key, Iterable<IntWritable> values, Context context) throws
IOException, InterruptedException {
        int max_temp = 0;
        int total_temp = 0;
        int count = 0;
        int days = 0;
        for (IntWritable value : values) {
            int temp = value.get();
            if (temp > max_temp)
                max_temp = temp;
            count++;
            if (count == 3) {
                total_temp += max_temp;
                max_temp = 0;
                count = 0;
                days++;
            }
        }
        context.write(key, new IntWritable(total_temp / days));
    }
}
```


CONNECTION=0
IO_ERROR=0
WRONG_LENGTH=0
WRONG_MAP=0
WRONG_REDUCE=0
File Input Format Counters
Bytes Read=888190
File Output Format Counters
Bytes Written=74
hadoop@bmscecse-HP-Elite-Tower-600-G9-Desktop-PC:~$ hadoop fs -ls /rgsWeatherRK/output/
Found 2 items
-rw-r--r-- 1 hadoop supergroup 0 2025-05-20 16:46 /rgsWeatherRK/output/_SUCCESS
-rw-r--r-- 1 hadoop supergroup 74 2025-05-20 16:46 /rgsWeatherRK/output/part-r-00000
hadoop@bmscecse-HP-Elite-Tower-600-G9-Desktop-PC:~$ hadoop fs -cat /rgsWeatherRK /output/part-00000
cat: `/rgsWeatherRK': Is a directory
are 1
brother 1
family 1
hi 1
how 5
is 4
job 1
sister 1
you 1
your 4
hadoop@bmscecse-HP-Elite-Tower-600-G9-Desktop-PC:~$ hadoop fs -cat /rgsWeatherRK /output/part-r-00000
cat: `/rgsWeatherRK': Is a directory
cat: `/output/part-r-00000': No such file or directory
hadoop@bmscecse-HP-Elite-Tower-600-G9-Desktop-PC:~$ hadoop fs -cat /rgsWeatherRK/output/part-r-00000
01 4
02 0
03 7
04 44
05 100
06 168
07 219
08 198
09 141
10 100
11 19
12 3
hadoop@bmscecse-HP-Elite-Tower-600-G9-Desktop-PC:~$