QUESTION 1

MapReduce Question:-

```
******code******
import java.io.*;
import org.apache.hadoop.io.Text;
import org.apache.hadoop.io.LongWritable;
import org.apache.hadoop.io.DoubleWritable;
import org.apache.hadoop.mapreduce.Job;
import org.apache.hadoop.mapreduce.Mapper;
import org.apache.hadoop.mapreduce.Reducer;
import org.apache.hadoop.conf.*;
import org.apache.hadoop.fs.*;
import org.apache.hadoop.mapreduce.lib.input.*;
import org.apache.hadoop.mapreduce.lib.output.*;
public class AllTimeHigh {
       public static class MapClass extends Mapper<LongWritable,Text,Text,DoubleWritable>
         {
                private Text stock_id = new Text();
                private DoubleWritable High = new DoubleWritable();
           public void map(LongWritable key, Text value, Context context)
            try{
              String[] str = value.toString().split(",");
              double high = Double.parseDouble(str[4]);
              stock_id.set(str[1]);
              High.set(high);
              //context.write(new Text(str[1]),new LongWritable(vol));
              context.write(stock_id, High);
            catch(Exception e)
              System.out.println(e.getMessage());
```

```
public static class ReduceClass extends Reducer<Text,DoubleWritable,Text,DoubleWritable>
                 private DoubleWritable result = new DoubleWritable();
                 public void reduce(Text key, Iterable<DoubleWritable> values,Context context) throws
IOException, InterruptedException {
                              double maxValue=0;
                              double temp_val=0;
                              for (DoubleWritable value : values) {
                                     temp_val = value.get();
                                     if (temp_val > maxValue) {
                                             maxValue = temp_val;
                              result.set(maxValue);
                  context.write(key, result);
                  //context.write(key, new LongWritable(sum));
                }
        public static void main(String[] args) throws Exception {
                 Configuration conf = new Configuration();
                 //conf.set("name", "value")
                 //conf.set("mapreduce.input.fileinputformat.split.minsize", "134217728");
                 Job job = Job.getInstance(conf, "Highest Price for each stock");
                 job.setJarByClass(AllTimeHigh.class);
                 job.setMapperClass(MapClass.class);
                 //job.setCombinerClass(ReduceClass.class);
                 job.setReducerClass(ReduceClass.class);
                 job.setNumReduceTasks(1);
                 job.setOutputKeyClass(Text.class);
                 job.setOutputValueClass(DoubleWritable.class);
                 FileInputFormat.addInputPath(job, new Path(args[0]));
                 FileOutputFormat.setOutputPath(job, new Path(args[1]));
                 System.exit(job.waitForCompletion(true)? 0:1);
select count(*) from nyse;
2022-06-20 09:39:42,945 Stage-1 map = 0%, reduce = 0%
2022-06-20 09:39:57,133 Stage-1 map = 100%, reduce = 0%, Cumulative
CPU 4.75 sec
```

```
2022-06-20 09:40:06,416 Stage-1 map = 100%, reduce = 100%,
Cumulative CPU 7.56 sec
MapReduce Total cumulative CPU time: 7 seconds 560 msec
Ended Job = job 1654490426372 5707
MapReduce Jobs Launched:
Stage-Stage-1: Map: 1 Reduce: 1 Cumulative CPU: 7.56 sec
                                                             HDFS
Read: 41000131 HDFS Write: 106 HDFS EC Read: 0 SUCCESS
Total MapReduce CPU Time Spent: 7 seconds 560 msec
OK
735026
Time taken: 59.27 seconds, Fetched: 1 row(s)
select stock id, max(high) from nyse group by stock id;
Hadoop job information for Stage-1: number of mappers: 1; number of
reducers: 1
2022-06-20 09:44:09,105 Stage-1 map = 0%, reduce = 0%
2022-06-20 09:44:58,510 Stage-1 map = 100%, reduce = 0%, Cumulative
CPU 4.98 sec
2022-06-20 09:45:08,917 Stage-1 map = 100%, reduce = 100%,
Cumulative CPU 8.73 sec
MapReduce Total cumulative CPU time: 8 seconds 730 msec
Ended Job = job 1654490426372 5731
MapReduce Jobs Launched:
Stage-Stage-1: Map: 1 Reduce: 1 Cumulative CPU: 8.73 sec
Read: 41000641 HDFS Write: 4521 HDFS EC Read: 0 SUCCESS
Total MapReduce CPU Time Spent: 8 seconds 730 msec
OK
AΑ
       94.62
AAI
       57.88
AAN
       35.21
      83.65
AAP
       25.25
AAR
       24.78
AAV
AB
       94.94
```

Time taken: 29.413 seconds, Fetched: 203 row(s)

QUESTION 2

```
hive (navnath5028)>
create table customers(
cust id INT,
firstname STRING,
lastname STRING,
age INT,
profession STRING
row format delimited
fields terminated by ','
stored as textfile;
OK
Time taken: 0.165 seconds
hive (navnath5028) > describe customer;
OK
cust id
                        int
firstname
                        string
lastname
                        string
age
                        int
profession
                        string
hive (navnath5028) > show tables;
OK
airlines
airport
customer
hive (navnath5028) > select count(*) from customer;
Hadoop job information for Stage-1: number of mappers: 2; number of
reducers: 1
2022-06-20 10:08:06,185 Stage-1 map = 0%, reduce = 0%
2022-06-20\ 10:08:17,707\ Stage-1\ map = 50\%, reduce = 0%, Cumulative
CPU 3.19 sec
2022-06-20 10:08:18,753 Stage-1 map = 100%, reduce = 0%, Cumulative
CPU 6.11 sec
2022-06-20 10:08:34,344 Stage-1 map = 100%, reduce = 100%,
Cumulative CPU 8.62 sec
MapReduce Total cumulative CPU time: 8 seconds 620 msec
Ended Job = job 1654490426372 5831
MapReduce Jobs Launched:
```

```
Stage-Stage-1: Map: 2 Reduce: 1 Cumulative CPU: 8.62 sec HDFS Read: 404450 HDFS Write: 105 HDFS EC Read: 0 SUCCESS Total MapReduce CPU Time Spent: 8 seconds 620 msec OK 10000
```

1) Write a program to find the count of customers for each profession

hive (navnath5028)>

select profession, count(profession) from customer group by profession;

```
Total MapReduce CPU Time Spent: 9 seconds 450 msec
OK
Accountant
                199
Actor 202
Agricultural and food scientist 195
Architect
                203
Artist 175
Athlete 196
Automotive mechanic
                        193
Carpenter
               181
Chemist 209
Childcare worker
                        207
Civil engineer 193
Coach
       201
Computer hardware engineer
                                204
Computer software engineer
                                216
Computer support specialist
                                222
Dancer 185
Designer
                205
Doctor 197
Economist
                189
Electrical engineer
                        192
Electrician
                194
Engineering technician 204
Environmental scientist 176
Farmer 201
Financial analyst
                        198
```

2) Write a program to find the top 10 products sales wise

```
hive (navnath5028)>
create table sales (
txn id INT,
txn date STRING,
cust id INT,
amount DOUBLE,
category STRING,
product STRING,
city STRING,
state STRING,
spendby STRING)
row format delimited
fields terminated by ','
stored as textfile;
OK
Time taken: 0.103 seconds
hive (navnath5028) > describe sales;
OK
txn id
                        int
txn date
                       string
cust id
                        int
amount
                        double
category
                       string
product
                       string
city
                        string
                        string
state
spendby
                        string
Time taken: 0.062 seconds, Fetched: 9 row(s)
```

select product,round(sum(amount),2) as amt from sales group by product order by amt desc limit 10;

```
Total MapReduce CPU Time Spent: 11 seconds 960 msec
Yoqa & Pilates 47804.94
```

```
Swing Sets 47204.14
Lawn Games 46828.44
Golf 46577.68
Cardio Machine Accessories 46485.54
Exercise Balls 45143.84
Weightlifting Belts 45111.68
Mahjong 44995.2
Basketball 44954.68
Beach Volleyball 44890.67
Time taken: 56.32 seconds, Fetched: 10 row(s)
```

3) Write a program to create partitioned table on category

```
hive (navnath5028)>
create table txnrecsByCat(
txn id INT,
txn date STRING,
cust id INT,
amount DOUBLE,
product STRING,
city STRING,
state STRING,
spendby STRING)
partitioned by (category STRING)
row format delimited
fields terminated by ','
stored as textfile;
OK
Time taken: 0.165 seconds
```

QUESTION 3 PySpark

1) What was the highest number of people who traveled in which year?

```
dataRDD=sc.textFile("/user/bigdatamind43836/airlines.csv")
dataRDD2=dataRDD.map(lambda a : a.encode("ascii", "ignore"))
header=dataRDD2.first()
```

```
dataRDD3=dataRDD2.map(lambda a : a != header)
dataRDD4=dataRDD3.map(lambda a : a.split(","))
keyword=dataRDD4.map(lambda a : (a[0],int(a[3])))
count=keyword.reduceByKey(lambda a,b : a+b)
sortbyval=count.sortBy(lambda a : -a[1])

for line in sortbyval.collect():
    print(line)
... print(i)
... output

('2007', 176299)
```

2) Identifying the highest revenue generation for which year

```
kvrdd2 = arrayrdd.map(lambda a : (a[0]+"
"+a[1],float(a[2])*int(a[3])))
counts2 = kvrdd2.reduceByKey(lambda a,b : a+b)
sort2 = counts2.sortBy(lambda a : -a[1])
>>> for i in sort2.take(1):
... print(i)
...
('2014 4', 18819408.48)
```

3) Identifying the highest revenue generation for which year and quarter (Common group)

```
kvrdd = arrayrdd.map(lambda a :(a[0],float(a[2])*int(a[3])))
counts = kvrdd.reduceByKey(lambda a,b : a+b)
>>> sort = counts.sortBy(lambda a : -a[1])
>>> for i in sort.take(1):
... print(i)
('2013', 66363208.71)
```













