과제2-2

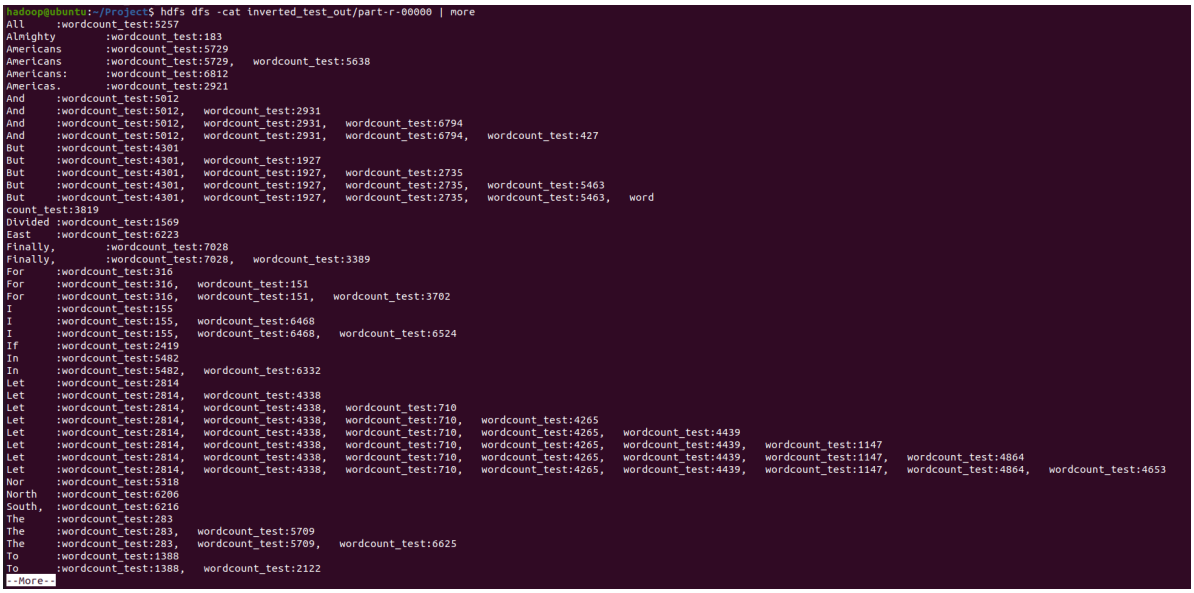
목표

1. invertedIndex 분산처리를 해보자

간단설명

hadoop을 이용하여 각 문서에 어느 위치에 어느 단어가 있는 지 알려주는 목차를 만들었다

결과



code

```java
package ssafy;

import java.io.IOException;
import java.util.StringTokenizer;

import org.apache.hadoop.conf.Configuration;
import org.apache.hadoop.fs.Path;
import org.apache.hadoop.io.LongWritable;
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.FileSplit;
import org.apache.hadoop.mapreduce.lib.input.FileInputFormat;
import org.apache.hadoop.mapreduce.lib.output.FileOutputFormat;
import org.apache.hadoop.util.GenericOptionsParser;
```

```
public class InvertedIndex {
    /*
    Object, Text : input key-value pair type (always same (to get a line of input
file))
    Text, IntWritable : output key-value pair type
    */
    public static class TokenizerMapper
            extends Mapper<Object,Text,Text,Text> {
            private Text word = new Text();
            private Text pos = new Text();
            private String filename;
            protected void setup(Context context) throws IOException,
InterruptedException{
            filename =((FileSplit)context.getInputSplit()).getPath().getName();
            }


        // map function (Context -> fixed parameter)
        public void map(Object key, Text value, Context context)
                throws IOException, InterruptedException {

            // value.toString() : get a line
            StringTokenizer itr = new StringTokenizer(value.toString()," 
",true);
            long p = ((LongWritable)key).get();
            while ( itr.hasMoreTokens() ) {
                String token = itr.nextToken();
                word.set(token.trim());
                if (! token.equals(" ")){
                    pos.set(filename+":"+p);
                    context.write(word,pos);
            }
            p+= token.length();
        }
    }
    }

    /*
    Text, IntWritable : input key type and the value type of input value list
    Text, IntWritable : output key-value pair type
    */
    public static class ConcatenatorReducer
            extends Reducer<Text,Text,Text,Text> {

        // variables
        private Text list = new Text();

        // key : a disticnt word
        // values :  Iterable type (data list)
        public void reduce(Text key, Iterable<Text> values, Context context)
                throws IOException, InterruptedException {
            String s = new String();
            int comma = 0;

            for ( Text val : values ) {
                if(comma ==0){
                comma = 1;
```

```
                s +=(":"+val.toString());
            } else {
                s +=(",   "+val.toString());
                }
            list.set(s);
            context.write(key,list);
        }
    }
    }


    /* Main function */
    public static void main(String[] args) throws Exception {
        Configuration conf = new Configuration();
        String[] otherArgs = new
GenericOptionsParser(conf,args).getRemainingArgs();
        if ( otherArgs.length != 2 ) {
            System.err.println("Usage: <in> <out>");
            System.exit(2);
        }
        /*FileSystem hdfs = FileSystem.get(conf);
        Path output = new Path(otherArgs[1]);
        if (hdfs.exists(output))
            hdfs.delete(output,true);
        */

        Job job = new Job(conf,"word count");
        job.setJarByClass(InvertedIndex.class);

        // let hadoop know my map and reduce classes
        job.setMapperClass(TokenizerMapper.class);
        job.setReducerClass(ConcatenatorReducer.class);

        job.setOutputKeyClass(Text.class);
        job.setOutputValueClass(Text.class);

        // set number of reduces
        job.setNumReduceTasks(2);

        // set input and output directories
        FileInputFormat.addInputPath(job,new Path(otherArgs[0]));
        FileOutputFormat.setOutputPath(job,new Path(otherArgs[1]));
        System.exit(job.waitForCompletion(true) ? 0 : 1 );
    }
}
```