BDT – cs523

Lab 2 - MapReduce Word Count Lab

- Submit your *own work* on time. No credit will be given if the lab is submitted after the due date.
- Note that the completed lab should be submitted in .zip format only.

This document is divided into two parts.

1. Practice Lab

a. MapReduce Java WordCount Implementation

Just try to run through all the steps and see if they work properly for you. It's very essential to get the word count program run properly on your machine.
No need to submit this part.

2. Homework Questions

a. Do some research and find out what code needs to be added to the Word Count program for automatic removal of "output" directory before job execution.

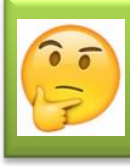
b. Run the above basic Word Count program in pseudo distributed mode with 2 reducers. Use `setNumReduceTask` method of `Job` object. Paste the screenshot of the two part-r-* files created in HDFS. (Note: multiple reducers work in pseudo-distributed mode and not local mode)

c. Modify the WordCount program to output the counts of only the words "Hadoop" and "Java". (Count *Hadoop* and *hadoop* as same word!)
Submit your output file along with java program.

d. Modify the WordCount program to output the counts of only those words which appear in the document at least 25 times.
Submit your output file along with java program.

e. Write a MapReduce program to find out how many distinct (unique) words are there in the input file. *(Hint: Remember that there's setup and cleanup methods in the Reducer)*
Submit your output file along with java program.

In your lab submission, I should be able to find the java programs for all (a), (b), (c), (d) and (e) with commands to run these programs in pseudo-distributed mode.
For (b), I'll need a screenshot as mentioned.



Food for thought

What if you want to produce an output file which will be sorted on Word Counts and not on Words?

Practice Lab - MapReduce Java WordCount Implementation

The purpose of this lab is to give you a feel of running MapReduce programs in Hadoop environment.

Make sure that you can run the given java Word Count program in Cloudera VM; both locally and in pseudo distributed mode.

1. Create a new *WordCount* project in Eclipse with the given *WordCount.java* file.
2. You'll see lots of errors now. To get rid of these errors, you need to properly configure the build path of the project by adding external jars from the following locations.

   ```
   File system/usr/lib/hadoop/client-0.20
   File system/usr/lib/hadoop
   File system/usr/lib/hadoop/lib
   ```

3. Once all the errors are gone, follow the following steps to run the word count program in local mode first and then in pseudo distributed mode.

Local Mode:

- Create a directory in your eclipse project structure as "input" and copy the given input file "Lab2-WC-Input.txt" there.
- You'll need to supply runtime arguments to your program as "input" and "output". These are the folder names which Hadoop will use to take input from and store output to, respectively. (alternatively, you can choose to have your own names!)
- Run the Java program in Eclipse and see that the output directory got created in your project path and there's the output file named "part-r-00000" which has the counts of all the words in your input file.

Pseudo-distributed Mode:

- Create a jar file of your Word Count program and save it on "Desktop".
- Then, create "input" folder in HDFS
  (under /user/cloudera, check it out using HDFS browser)
  `hadoop fs -mkdir input`
- Put the given input file in this newly created HDFS input folder.
  `hadoop fs -put /home/cloudera/Desktop/Lab2-WC-Input.txt input`
- Run your MR word count job using the command given below.
  `hadoop jar /home/cloudera/Desktop/wordcount.jar WordCount input output`
- After running the program, check the output in HDFS.