HOMEWORK 2 – KARAN KADAKIA – UIN: 655641760

How to run the XMLParser

- dblp.xml and dblp.dtd should be saved in the XMLParser folder in order for the project to run Link: https://dblp.uni-trier.de/xml/
- Delete the author_pairs.txt before running the program
- Import the Java Project in the IDE
- Make sure the prof_name_list.txt file(File is present in XMLParser) is saved in the XMLParser folder. This file contains a list of the cs professor which is used to parse the dblp.xml file
- When test cases are run output file changes, so run test before running the actual project and then delete the output file authors.txt
- Run the project
- Output is saved programatically in author_pairs.txt file

How to run the MapReduce code

- Import the folder MapRed in IDE
- Go to > Run configurations
- Provide the location of input and output file location in the Arguments
- Input file is author_pairs.txt which is present in the folder MapRed
- Run the project
- Output file is generated in a folder named output.txt named "part-r-00000.txt"
- Output file is currently present in the project delete it before running the project

Example of the output format

- If the output has single authors without any collaboration then it comes out as below:
  - Luc Renambot 15

- If the authors have collaborated then output is:
  - Mark Grechanik,Ugo Buy 3

- Actual results attached in the file below:

part-r-00000.txt

How to perform Visualization

- Open the folder named "Visualization_code"
- This folder contains the text file named "part-r-00000.txt" which is the output of runnning MapReduce
- This output is converted to a DOT format using the python script named "dotcode_script.py"
- The output generated by the python script is saved in the file named "di_output.txt"

- The DOT format output(present in Visualization_code/di_output.txt) can be copy pasted on the website http://viz-js.com/ and the visualization can be seen on the right side

Visualization snapshot

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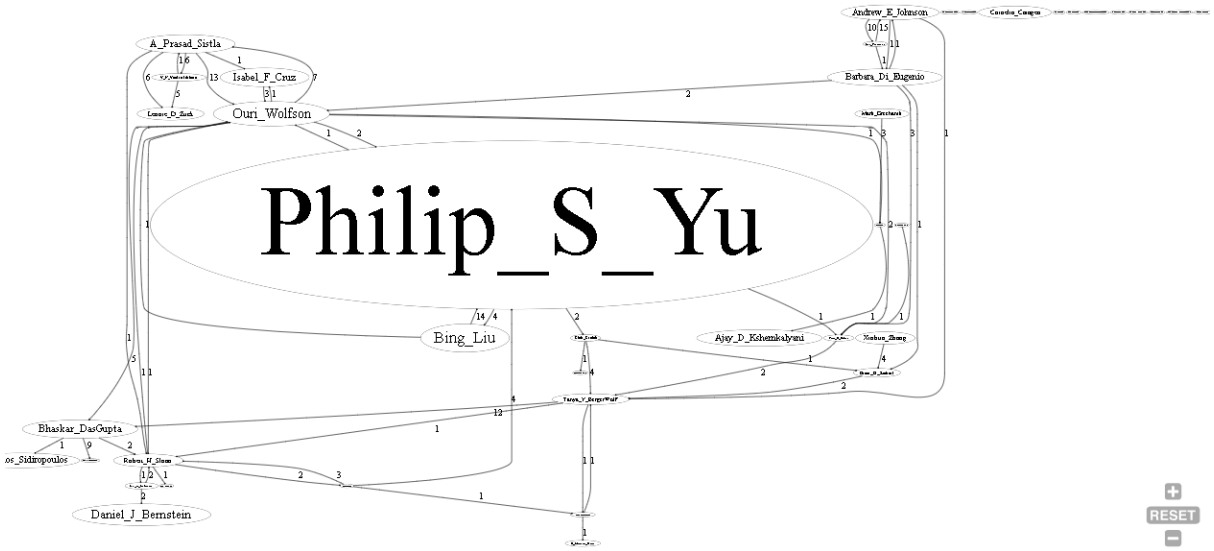

Conceptual explanation how map reduce works

Overall steps in map reduce:

1. Map tasks (Splits and Mapping)
2. Reduce tasks (Shuffling, Reducing)

- The Hadoop job client submits the job and configuration to the JobTracker which then assumes the responsibility of distributing the software/configuration to the slaves, scheduling tasks and monitoring them, providing status and diagnostic information to the job-client.
- It is the responsibility of job tracker to coordinate the activity by scheduling tasks to run on different data nodes
- Execution of individual task is then to look after by task tracker, which resides on every data node executing part of the job.
- Framework views the input to the job as a set of <key, value> pairs and produces a set of <key, value> pairs as the output of the job
- A MapReduce job usually splits the input data-set into independent chunks which are processed by the map tasks in a completely parallel manner.
- The number of maps is usually driven by the total size of the inputs, that is, the total number of blocks of the input files.
- Hadoop sorts the framework of the map which are then fed to the the reduce task
- Reducer has 3 primary phases: shuffle, sort and reduce.

- The framework groups Reducer inputs by keys (since different mappers may have output the same key) in this stage.
- The shuffle and sort phases occur simultaneously while map-outputs are being fetched they are merged.
- In this phase the reduce(WritableComparable, Iterable<Writable>, Context) method is called for each <key, (list of values)> pair in the grouped inputs.

Steps involved in setting up AWS EMR

- Setup the EC2 security key pair
- S3 bucket setup, contains input file and Mapreduce JAR file, output is created here
- JAR file is created by exporting the project as a runnable JAR file in eclipse IDE
- Create a EMR cluster, steps are: select the s3 bucket, select the EC2 key pair, create cluster, add step, provide input output arguments in the step and run it
- Output can be seen in the s3 bucket