Programming Assignment 6

1 Assignments

1. Perform the parallel breadth-first search on a directed graph.

   - The input graph is saved as one of multiple files under the folder "input-graph".
   - Each node is saved as one line in a file.
   - The search will go through multiple iterations. The output graph of iteration i is saved as one or multiple files under the folder "output-graph-i".
   - The program will take one required argument and two optional arguments:
     - The required argument: the number of iterations of the search process, such as "-i 10".
     - Two optional arguments: the number of mappers and the number of reducers, such as "-m 3" and "-r 3", respectively.

2. A node is saved as a string in a file such as "ID ID_description".

   - The ID and ID_description is delimited by one or more whitespace characters.
   - ID_description is of the following format, "edges|weights|cost|color".
     - "edges" actually is the adjacency list representing the list of reachable nodes delimited by "," such as "2,3,5,18".
     - "weights" represents the weights of the edges between the node and its neighbors delimited by "," such as "1,3,5,2".
     - "cost" is the cost from the source. Infinity is represented as "Integer.MAX_VALUE".
     - "color" represents the status of the node.
       * WHITE: not visited yet.
       * GRAY: being visited.
       * BLACK: already visited.

2 Submission

- Due date: March 27, 2019 @ 11:59 AM.

- Submission

  - Name the two files as Node.java and GraphSearch.java.
  - tar -cvf pa6_<your last name>.tar file(s).
  - Upload the tar file to blackboard before deadline.