CS F422 - Assignment 2: Problem 1

Problem Statement

PageRank: Parallel Implementation using MPI and OpenMP

1. Read and understand :
   David Gleich, Leonid Zhukov, Pavel Berkhin. *Fast Parallel PageRank: A Linear System Approach*. Technical report, Yahoo!, Sunnyvale, CA, 2004. (available at: https://www.cs.purdue.edu/homes/dgleich/publications/gleich2004-parallel.pdf)
2. Design your own hybrid implementation of PageRank for a target platform that is a cluster of multi-core workstations. [You may use any and all ideas from the reference given above.]
3. Implement your solution using MPI for message passing programming on the cluster and OpenMP for shared memory programming within a single node. Implement your solution in three steps:
   1. MPI version where each process is single-threaded
   2. OpenMP version to run in a multicore node
   3. A hybrid version combining both of these.
4. Performance Measurement:
   1. Run the encoded solution on various inputs of varying sizes and measure the time taken.
   2. Demonstrate scalability of your solution by plotting a performance curve with varying number of nodes in the cluster (M = 1, 2, 4, 8) and varying number of threads in a multi-core node (N = 1, 2, 4, 8).