PDC Project
Parallel Social Behavior-Based Algorithm for Identification of Influential Users in Social Network

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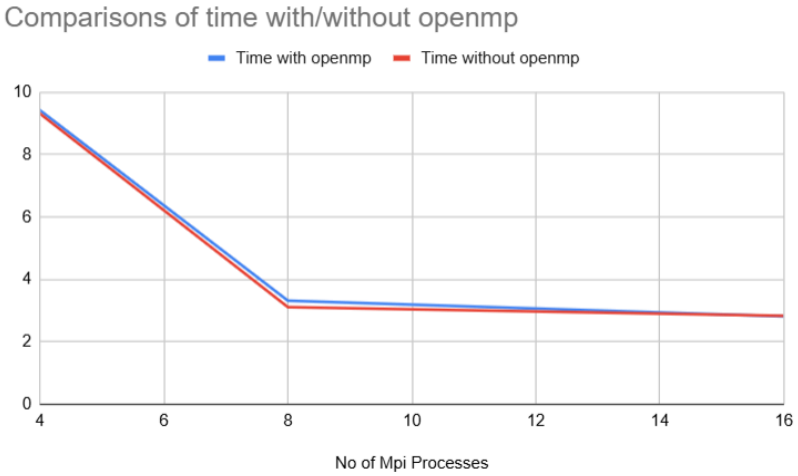
Approach:
Use of METIS and OpenMPI:

- Root process at master divides the dataset graph into smaller subgraphs using METIS. Each process on the nodes will handle one subgraph.
- When each process receives a subgraph, it will apply the entire PSAIIM algorithm on it.
- After finding seed nodes in the dedicated subgraph, results are returned to the root process at master.
- The root process selects “k” best seed nodes.

Use of OpenMP:

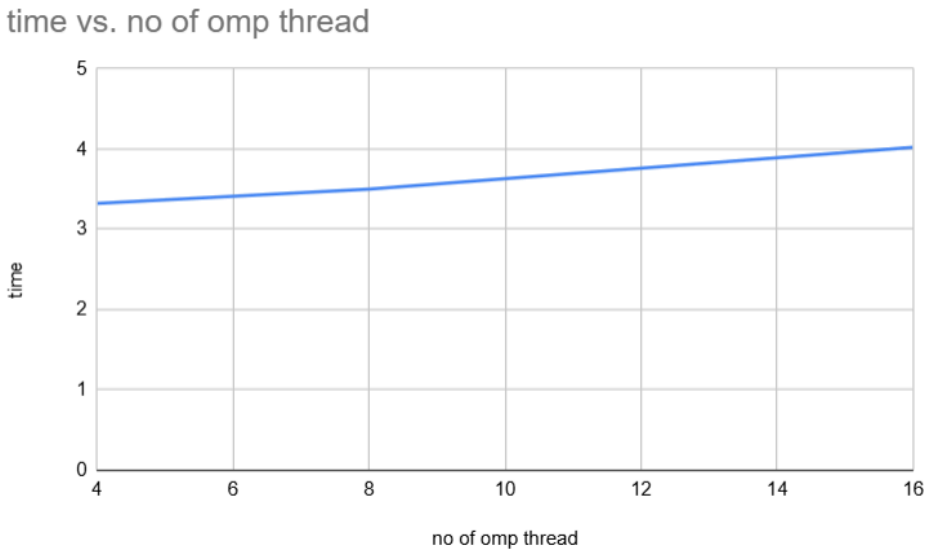
- The PSAIIM algorithm works in serial for the most part.
- The parallel execution is done during the PageRank algorithm to find the influence power of nodes. For this parallelization, openMP was utilized.

Graphs To Visualize Results:
Varying Number of MPI Processes:
(OpenMP threads are 4 for each of those processes)

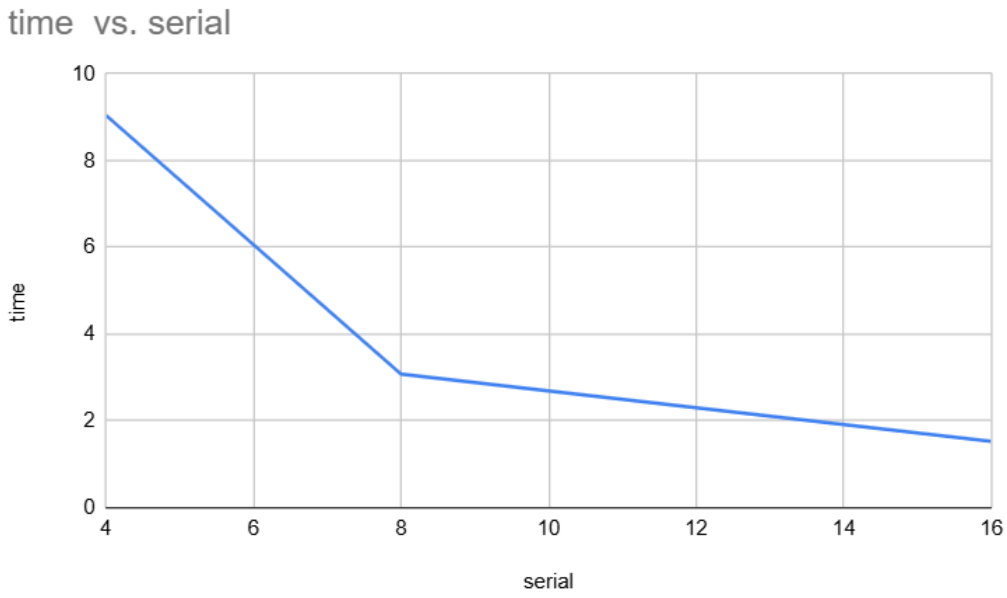


Varying Number of OpenMP Threads:

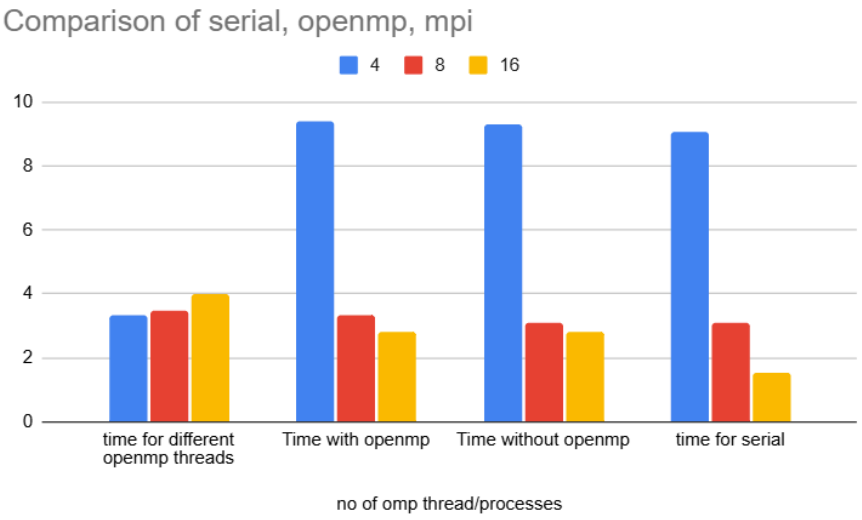
(MPI Processes are 8 for each of these runs)



Time for Serial Execution with Different Partitions:



Comparison of All



Hotspot Analysis

Time (%)	Cumulative Time (s)	Calls	Function Name
88.40	118.12	979835	`cac_algorithm`
8.61	127.61	146963	`find_influenced_nodes`
1.57	129.71	1049301	`std::vector<>::begin`
0.94	131.00	2423605	`std::vector<>::end`
0.17	131.24	122389	`get_neighbors`