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Department of Computer Science and Engineering
19CSE312 - Distributed Systems - CSE F
Lab Evaluation - 1

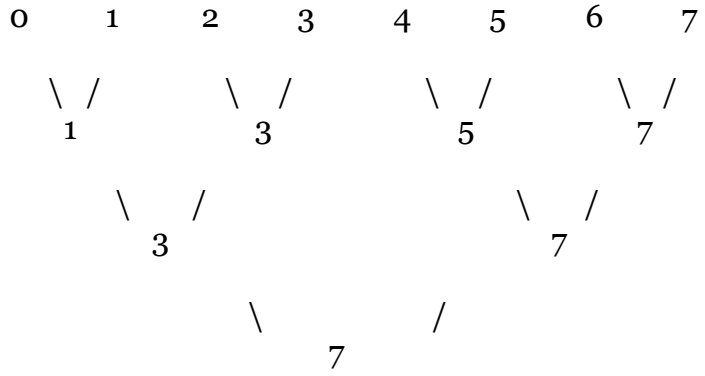
Date: 27. 03. 2023 **Topic: MPI Program** **Total Marks: 40**

CO01: Understand the design principles in distributed systems and the architectures for distributed systems.
CO02: Apply various distributed algorithms related to clock synchronization, concurrency control, deadlock detection, load balancing, voting etc.
CO03: Analyze fault tolerance and recovery in distributed systems and algorithms for the same.
CO04: Analyze the design and functioning of existing distributed systems and file systems.
CO05: Design and implement a simple distributed system and implement different distributed algorithms over it.

SET - 2

Question 1: CO05, BTL - 3, DL - 2

Create a Tournament tree communication structure with 8 players(processors). Players store the scores of their matches, and each player will post their best score to their opponent. The player with the maximum score will go to the next round of the tournament. Design and implement the tournament tree communication structure and find the winner. Ensure that tournament proceeds to the next round only after all the players for that round are selected.



At each level of the tournament, a winner is as described above. A final winner of the tournament is decided and printed. You can decide which processors to be involved in each level of communication.

Question 2: CO05, BTL - 3, DL - 2

Create an adjacency matrix of order 6 X 6, and distribute the information of each node to 6 different processes. Following are the individual tasks assigned for each computing node. Apart from that, each node will compute the degree of the vertex and sends that information to the root node(Process with rank = 0)

Process 0 - (a) will display the original adjacency matrix and degree of the vertex (i.e., before performing the modifications) along with the rank

(b) Displays the modified adjacency matrix, the node with min degree and max degree(after the graph modification), and the rank.

Process 1 - finds all the adjacency nodes and display the result with the rank.

Process 2 - inverts the edges and displays the result with the rank

Process 3 - counts the nodes not adjacent to it and displays the result with the rank.

Process 4 - creates edges with all the nodes in the graph and displays the result with the rank.

Process 5 - creates edges with only even node ids and displays the result with the rank.

Evaluation Rubrics

Designing solution

For both the questions

A. Design the communicating world.
B. What type of communication do you select (Point - to - point or Collective Communication)?
C. What type of communication mode is planned? (Blocking/Non-blocking).
D. Give justification for your selection and augment your design with a diagram which represents the communication happening between the communicating world.

Design (8 Marks)	Implementation (8 Marks)	Output (4 Marks)
Correct design with proper justification - (5 - 8 Marks)	Is the Implementation similar to design, syntax, logic correct - (6 - 8 Marks)	Correct output - 4 Marks
Partially correct design - (3 - 4 Marks)	Partially implemented - (3 - 5 Marks)	No Error in code, Partial output - 2 Marks
Poor design - (0 - 2 Marks)	Implementation not correlating with the design - 0 Marks	Code Error - 0 Marks