

Assignment No. 4

Election Algorithms

\* Problem Statement:

Election - Ring: Implement a Ring Election Algorithm for distributed systems in Java. In this algorithm assume that the link between the process are unidirectional and every process can message to the process on its sight only. Each process is associated with name, priority and state (Active) Inactive). Accept the number of processes from the user with their priorities and states. Select the process with highest priority as co-ordinator. Allow user to choose any active process to initialize election.

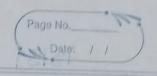
\* Objectives:

To lease election algorithms.

\* Theory :

Distributed Algorithm

Distributed Algorithm is an algorithm that runs on distributed system. Each processor has its own memory of they communicate via communication retworks Many algorithms running in distributed system require



a co-ordination that performs functions needed by other process in the system. Election algorithms are designed to choose the co-ordinations.

Assumptions:

tach process has a unique number to distinguish them 4 processes know each others process rumbers

Types:

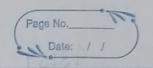
1) Bully Algorithm

This algorithm applies to the systems where every process can send a request or a message to know other process in these system.

Algorithm:

Process P'sends a message to co-ordinator

- A) If co-ordinator does not respond to et within a time interval 'T'. then it is assumed that co-ordinator has failed.
- B) Brocess P sends an election message to every process with higher priority number.



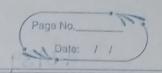
- c) waits for responses. If no one responds in time to then process elects itself as the co-ordinator.
- D) sends message to all lower priority number that P is the new co-ordinator.
- ET If answer is seeieved within time I from any other process Q.
- O Process P waits for time T to serieve another message from a that it has been selected as co-ordinator
- algorithm restarts.

Ring Algorithm

This algorithm applies to systems organised as rings links are unidirectional and on process to right only. It was list data structure.

Algorithm

A] If process PI detects a coordinator failure, et creates a new active list which is empty initially. It sends election message to its neighbour on the right odd number ( to els active list.



- B) If process P2 recieves message from P1 ir responds in 3 ways.
- is If the message recieved doesn't contain I in active list then PI adds 2 to its active list of formwards the message.
- 2) If this is the first election message, it has serieved or sent. PI creates a new active list with numbers 1 & 2. It then sends election message I followed by 2
- 3> If process PI recieves its own message I then the active list for PI now contains numbers of all the active processes in the system. Now process PI delects the highest priority number from the list and cleats it as the new co-ordinator.

\* Conclusion:

Election algorithms were studied both Bully f

Ping algorithms were implemented successfully.