

Title Ring & Bully Algorithm

Problem Statement

Simulation of election algorithms (ring & bully).
Write a program in C/C++/Java/Python.

Learning Objectives

- 1) To learn & understand election algorithm
- 2) To implement & simulate ring & bully algorithm.

Hardware & Software Requirement

Windows 10 64-bit

Intel core i5 8th gen 4-core CPU

8GB RAM, 512GB SSD.

Theory

1) Election algorithms choose a process from group of processes to act as a coordinator.

If co-ordinator process crashes due to some reasons then a new co-ordinator is selected from other processes.

2) Election algorithm determines where a new copy of co-ordinator should be restarted.

3) Bully Algorithm:

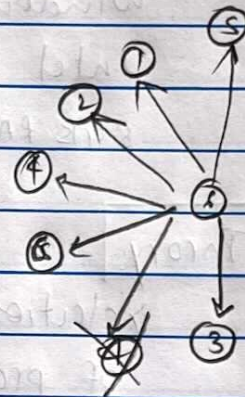
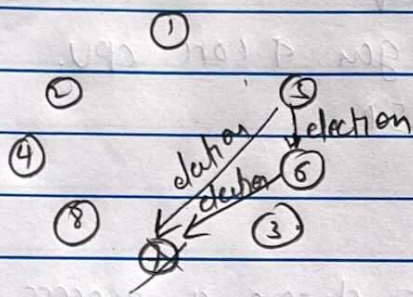
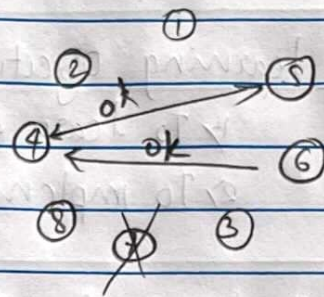
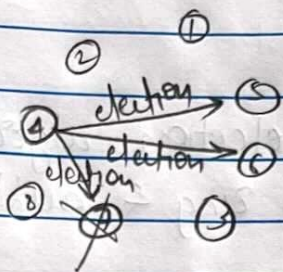
1) When any process notices that the co-ordinator is no longer responsible to request it indicates an IP sends election message to all processes with higher numbers.



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2) If no-one responds p wins the election & become co-ordinator.

3) If one of the higher number answer it takes over p 's job is done.



If process 7 restarted, it shall just send all the others a coordinator message & bully them into submission.

Ring Algorithm:

When any process notices that the co-ordinator is not functioning, it builds an election message containing its own process number & sends message to its successor.

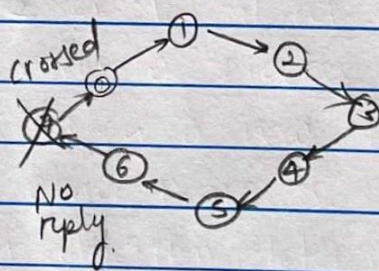
2) If the successor is down the sender sweeps over the successor & goes to the next number along the ring or the one after that until a running process is located.

- In such step the sender adds its own process number to the list in the message effectively moving itself a candidate to be elected as co-ordinator.

- Eventually the message gets back to the process that started it all.

That process recognises this event when it receives an incoming message containing its own process number.

- At that point the process with highest priority sends co-ordinator to & circulates one again to tell the roles & get back to work.



- 6 is chosen as new co-ordinator one more loop to notify this

Conclusion:

In this assignment, I have successfully implemented & tested/simulated the election (ring & bully) algorithm.