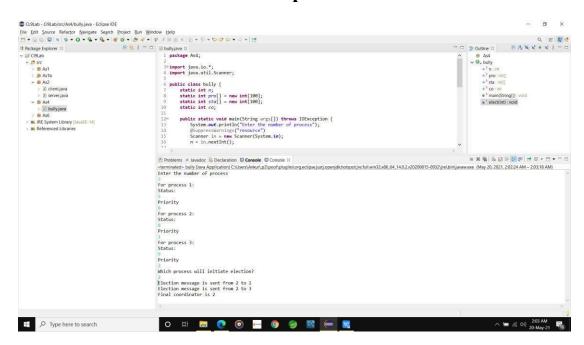
ASSIGNMENT-4

```
Aim and Objective: To develop Token Ring distributed
algorithm for leader election
Tools / Environment: Java Programming Environment,
JDK 1.8, EclipseNeon(EE).
CODES
package As4;
import java.io.*;
import java.util.Scanner;
publicclass bully {
       staticintn;
       staticintpro[] = newint[100];
       staticintsta[] = newint[100];
       staticintco;
       publicstaticvoid main(String args[]) throws IOException
               { System.out.println("Enter the number of process");
               @SuppressWarnings("resource")
               Scanner in = new Scanner(System.in);
               n = \text{in.nextInt()};
               inti;
               for (i = 0; i < n; i++) {
                      System. out. println("For process" + (i + 1) + ":");
                      System.out.println("Status:");
                      sta[i] = in.nextInt();
                      System.out.println("Priority");
                      pro[i] = in.nextInt();
               }
               System.out.println("Which process will initiate election?");
               intele = in.nextInt();
               elect(ele);
               System. out. println ("Final coordinator is" + co);
       staticvoid elect(intele) {
               ele = ele - 1;
               co = ele + 1;
```

Outputs



Related Theory:

Election Algorithm:

- 1. Many distributed algorithms require a process to act as a coordinator.
- 2. The coordinator can be any process that organizes actions of other processes.
- 3. A coordinator may fail.
- 4. How is a new coordinator chosen or elected?

Assumptions:

Name: Datta Tandale, Roll no: B1851002, PRN: 72000298C

Each process has a unique number to distinguish them. Processes know each other's process number.

There are two types of Distributed Algorithms:

- 1. Bully Algorithm
- 2. Ring Algorithm

BullyAlgorithm:

A. When a process, P, notices that the coordinator is no longer responding to requests, itinitiates an election.

- 1. P sends an ELECTION message to all processes with higher numbers.
- 2. If no one responds, P wins the election and becomes a coordinator.
- 3. If one of the higher-ups answers, it takes over. P's job is done.

B. When a process gets an ELECTION message from one of its lower-numbered colleagues:

- 1. Receivers ends an OK message back to the sender to indicate that he is a live and will take over.
- 2. Eventually, all processes giveup apart of one, and that one is the new coordinator.
- 3. The new coordinator announce sits victory by sending all processesa **CO- ORDINATOR** message telling them that it is the new coordinator.

C. If a process that was previously down comes back:

1. It holds an election.

If it happens to be the highest process currently running, it will win the election and takeover the coordinators job.

Conclusion:

Election algorithms are designed to choose a coordinator. We have two election algorithms for two different configurations of distributed system. The Bully algorithm applies to system where every process can send a message to every other process in the system and The Ring algorithm m applies to systems organized as a ring (logically or physically). In this algorithm we assume that the link between the process are unidirectional and every process can message to the process on its right only.