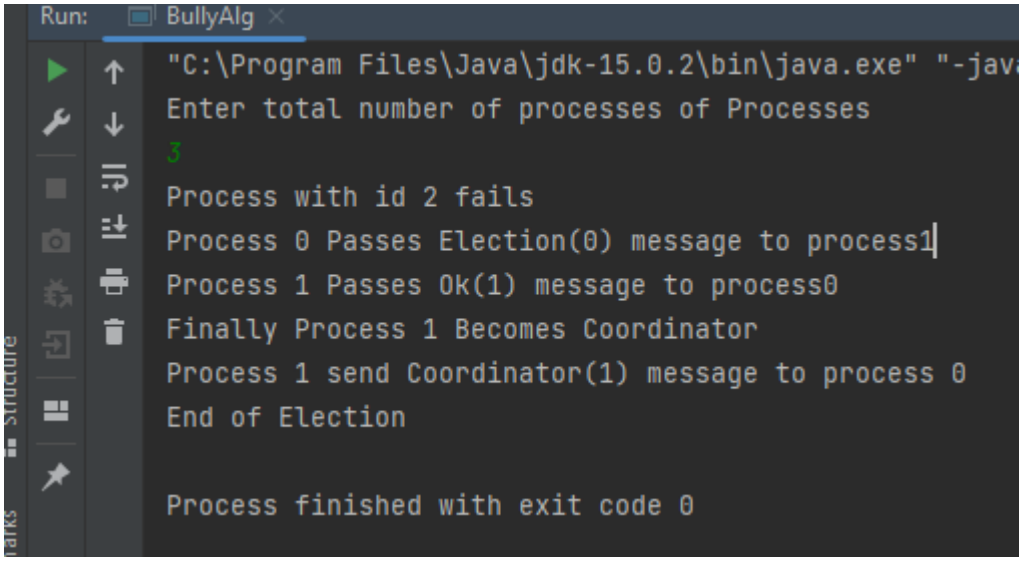
# Tema 4




Am un numar de procese si am dat un status fiecarui process, iar pocesul care initial este lider este terminat. Apoi se apeleaza algoritmul bully pentru a alege un lider nou.

```
package org.example;

import java.util.Scanner;

// create process class for creating a process having id and status
class Process {
    public int id;
    public String status;

    public Process(int id){
        this.id = id;
        this.status = "active";
    }
}
public class BullyAlg {

    Scanner sc;
    Process[] processes;
    int n;

    public BullyAlg(){
        sc= new Scanner(System.in);
    }

    // method for initializing the processes
    public void initialize(){

        // get input from the user for processes
        System.out.println("Enter total number of processes of Processes");
        n = sc.nextInt();
```

```
        // initialize processes array
        processes = new Process[n];
        for(int i = 0; i<n; i++){
            processes[i]= new Process(i);
        }
    }

    // create election() method for electing process
    public void performElection(){

        // we use the sleep() method to stop the execution of the current
thread
        try {
            Thread.sleep(1000);
        } catch (InterruptedException e) {
            e.printStackTrace();
        }

        // show failed process
        System.out.println("Process with id " + processes[getMaxValue()].id +
" fails");

        // change status to Inactive of the failed process
        processes[getMaxValue()].status = "Inactive";

        // declare and initialize variables
        int idOfInitiator = 0;
        boolean overStatus = true;

        // use while loop to repeat steps
        while(overStatus){
            boolean higherProcesses = false;

            // iterate all the processes
            for(int i = idOfInitiator + 1; i< n; i++){
                if(processes[i].status.equals("active")){
                    System.out.println("Process " + idOfInitiator
                            + " Passes Election("
                            + idOfInitiator+") message to process" +i);
                    higherProcesses = true;
                }
            }

            // check for higher process
            if(higherProcesses){

                // use for loop to again iterate processes
                for(int i = idOfInitiator + 1; i< n; i++){
                    if(processes[i].status == "active"){
                        System.out.println("Process " + i + " Passes
Ok("+i+") message to process" + idOfInitiator);
                    }

                }
                // increment initiator id
                idOfInitiator++;
            }
```

```
            else{
                // get the last process from the processes that will become
coordinator
                int coord = processes[getMaxValue()].id;

                // show process that becomes the coordinator
                System.out.println("Finally Process " + coord + " Becomes
Coordinator");

                for(int i = coord - 1; i>= 0; i--){
                    if(processes[i].status == "active"){
                        System.out.println("Process " + coord + " send
Coordinator(" + coord + ") message to process " +i);
                    }
                }

                System.out.println("End of Election");
                overStatus = false;
                break;
            }
        }

    }

    // create getMaxValue() method that returns index of max process
    public int getMaxValue(){
        int mxId = -99;
        int mxIdIndex = 0;
        for(int i = 0; i<processes.length; i++){
            if(processes[i].status == "active" && processes[i].id >mxId){
                mxId = processes[i].id;
                mxIdIndex = i;
            }
        }
        return mxIdIndex;
    }

    // main() method start
    public static void main(String[] args) {

        BullyAlg bully = new BullyAlg();

        bully.initialize();
        bully.performElection();
    }

}
```