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Class: BE-CO	Batch: 01
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Aim : To Implement the Bully Algorithm.

Code:
BullyAlgoExample2.java

```java
import java.util.Scanner;

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

    // initialize variables using constructor
    public Process(int id){
        this.id = id;
        this.status = "active";
    }
}
// create class BullyAlgoExample2 for understanding the concept of Bully algorithm
public class BullyAlgoExample2 {

    // initialize variables and array
    Scanner sc;
    Process[] processes;
    int n;

    // initialize Scanner class object in constructor
    public BullyAlgoExample2(){
        sc= new Scanner(System.in);
    }

    // create ring() method for initializing the ring
```

```java
    public void ring(){

        // 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 having 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 == "active"){
                    System.out.println("Process "+idOfInitiator+" Passes
Election("+idOfInitiator+") message to process" +i);
```

```java
                    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+"Passes Coordinator("+coord+")
message to process " +i);
                    }
                }


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

    }
```

```java
    // 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) {

        // create instance of the BullyAlgoExample2 class
        BullyAlgoExample2 bully = new BullyAlgoExample2();

        // call ring() and performElection() method
        bully.ring();
        bully.performElection();

    }

}
```

A:\Users\Sohail Sayyed\Desktop\Desktop 1\college files\Sem VIII\DC\DC Lab>javac BullyAlgoExample2.java

A:\Users\Sohail Sayyed\Desktop\Desktop 1\college files\Sem VIII\DC\DC Lab>java BullyAlgoExample2
Enter total number of processes of Processes
3
Process having id 2 fails
Process 0 Passes Election(0) message to process1
Process 1Passes Ok(1) message to process0
Finally Process 1 Becomes Coordinator
Process 1Passes Coordinator(1) message to process 0
End of Election

```
A:\Users\Sohail Sayyed\Desktop\Desktop 1\college files\Sem VIII\DC\DC Lab>java BullyAlgoExample2
Enter total number of processes of Processes
4
Process having id 3 fails
Process 0 Passes Election(0) message to process1
Process 0 Passes Election(0) message to process2
Process 1Passes Ok(1) message to process0
Process 2Passes Ok(2) message to process0
Process 1 Passes Election(1) message to process2
Process 2Passes Ok(2) message to process1
Finally Process 2 Becomes Coordinator
Process 2Passes Coordinator(2) message to process 1
Process 2Passes Coordinator(2) message to process 0
End of Election
```

Conclusion:

Bully Algorithm has been executed successfully and gives the required output.