



ANJUMAN-I-ISLAM'S KALSEKAR TECHNICAL CAMPUS
School of Engineering & Technology

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| Class: BE-CO | Batch: 01 |
| Roll no: 18CO48 | Experiment No: 05 |

Aim : To Implement the Bully Algorithm.

Code:

BullyAlgoExample2.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
```

```

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);

```

```

        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;
}
}
}

```

```

// 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.