

Program:

```
import java.util.*;

public class BullyAlgorithm {

    static int num_pr; // Number of processes
    static int old_cord; // The failed coordinator or leader
    static int new_cord; // The new elected leader
    static int curr_elec; // The current process that is holding the election
    static int[] isActive;
    static int failed_process;

    public static void main(String[] args) {

        Scanner sc = new Scanner(System.in);

        System.out.println("Enter the number of processes: ");
        num_pr = sc.nextInt();

        isActive = new int[num_pr + 1];
        for (int i = 1; i <= num_pr; i++) {
            isActive[i] = 1;
        }

        old_cord = num_pr;
        // Leader has failed
        isActive[old_cord] = 0;

        System.out.println("Enter the process that initiates the election process: ");
        curr_elec = sc.nextInt();

        System.out.println("The process that failed is: " + old_cord + "\n");
    }
}
```

```
System.out.println("Enter the process that fails (other than the leader process), if none then  
enter 0: ");
```

```
failed_process = sc.nextInt();
```

```
if (failed_process != 0) {  
    isActive[failed_process] = 0;  
}
```

```
// Output
```

```
new_cord = election_process(isActive, old_cord, curr_elec);
```

```
System.out.println("Finally, process " + new_cord + " became the new leader\n");
```

```
// Inform all processes about new leader
```

```
for (int i = 1; i <= num_pr; i++) {  
    if (isActive[i] == 1 && i != new_cord) {  
        System.out.println("Process " + new_cord + " passes a Coordinator (" + new_cord + ")  
message to process " + i);  
    }  
}  
}
```

```
public static int election_process(int[] isActive, int old_cord, int curr_elec) {
```

```
    int higher_process = curr_elec;
```

```
    for (int i = curr_elec; i <= num_pr; i++) {  
        if (isActive[i] == 1) {  
            for (int j = i + 1; j <= num_pr; j++) {  
                if (isActive[j] == 1) {  
                    System.out.println("Process " + i + " passes Election(" + curr_elec + ") message to  
process " + j);  
                }  
            }  
        }  
    }
```

```

        System.out.println();

        for (int j = i + 1; j <= num_pr; j++) {

            if (isActive[j] == 1) {

                System.out.println("Process " + j + " passes Ok(" + j + ") message to process " + i);

            }

            if (higher_process < j) {

                higher_process = j;

            }

        }

        System.out.println();

    }

}

return higher_process;

}

}

```

Output

```

Windows PowerShell
PS C:\Users\payal\Downloads\DS_Lab\DS6> javac BullyAlgorithm.java
PS C:\Users\payal\Downloads\DS_Lab\DS6> java BullyAlgorithm
Enter the number of processes:
5
Enter the process that initiates the election process:
2
The process that failed is: 5

Enter the process that fails (other than the leader process), if none then enter 0:
0
Process 2 passes Election(2) message to process 3
Process 2 passes Election(2) message to process 4

Process 3 passes Ok(3) message to process 2
Process 4 passes Ok(4) message to process 2

Process 3 passes Election(2) message to process 4

Process 4 passes Ok(4) message to process 3

Finally, process 5 became the new leader

Process 5 passes a Coordinator (5) message to process 1
Process 5 passes a Coordinator (5) message to process 2
Process 5 passes a Coordinator (5) message to process 3
Process 5 passes a Coordinator (5) message to process 4
PS C:\Users\payal\Downloads\DS_Lab\DS6> |

```