Bully Algorithm Program:

```
package Bully;
import java.util.Scanner;

public class Bully
{
   static boolean state[]  = new boolean[5];
   int coordinator;
   public static void up(int up)
   {
      if(state[up-1]==true)
      {
         System.out.println("Process "+up+" is already up");
      }
      else
      {
         state[up-1] = true;
         System.out.println("Process "+up+" held election");
         for(int i=up;i<5;i++)
         {
            System.out.println("Election message sent from process "+up+" to process
"+(i+1));
         }
         for(int i=up+1;i<=5;i++)
         {
            if(state[i-1]==true)
            {
              System.out.println("Alive message send from process "+i+" to process "+up);
              break;
            }
         }
      }
   }
   public static void down(int down)
   {
      if(state[down-1]==false)
      {
         System.out.println("process "+down+" is already dowm.");
      }
      else
      {
         state[down-1] = false;
         System.out.println("process "+down+" is now dowm.");

      }
   }

   public static void mess(int mess)
   {
```

```
    if(state[mess-1]==true)
    {
       if(state[4]==true)
       {
          System.out.println("Coordinator message send from process "+mess+" to all");
       }
       else
       {
          if(state[4]==false)
          {
          System.out.println("Process "+mess+" election");
          for(int i=mess;i<5;i++)
          {
             System.out.println("Election send from process "+mess+" to process "+(i+1));
          }

       for(int i=5;i>=mess;i--)
       {
          if(state[i-1]==true)
          {
             System.out.println("Coordinator message send from process "+i+" to all");
             break;
          }
       }
       }
    }
}
    else
    {
       System.out.println("Prccess "+mess+" is down");
    }
}

public static void main(String[] args) {
    // TODO code application logic here
    Scanner sc = new Scanner(System.in);
    int choice;
    for(int i=0;i<5;i++)
    {
       state[i] = true;
    }
    System.out.println("5 Active processes are:");
    System.out.println("Processes up  = p1 p2 p3 p4 p5");
    System.out.println("Process 5 is the coordinator");

    do
    {
       System.out.println("\n.....\n");
       System.out.println("1. Up a process");
       System.out.println("2. Down a process");
```

```
            System.out.println("3. Send a message");
            System.out.println("4. Exit");
            choice = sc.nextInt();
            switch(choice)
            {
               case 1:
               {
                  System.out.println("Bring process up");
                  int up = sc.nextInt();
                  if(up==5)
                  {
                     System.out.println("Process 5 is up and is the Co-ordinator");
                     state[4] = true;

                  }
                  else
                  {
                     up(up);
                  }
               }
               break;
               case 2:
               {
                  System.out.println("Bring down any process.");
                  int down = sc.nextInt();
                  down(down);
               }
               break;
               case 3:
               {
                  System.out.println("Which process will send a message");
                  int mess = sc.nextInt();
                  mess(mess);
               }
               break;

            }

         }
         while(choice!=4);
      }

}
```

Output:

```
$ javac Bully.java
$ java Bully

5 Active processes are:
Processes up  = p1 p2 p3 p4 p5
Process 5 is the coordinator

.....

1. Up a process
2. Down a process
3. Send a message
4. Exit
1
Bring process up
2
Process 2 is already up

.....

1. Up a process
2. Down a process
3. Send a message
4. Exit
3
Which process will send a message
1
Coordinator message send from process 1 to all

.....

1. Up a process
2. Down a process
3. Send a message
4. Exit
4
```