Practical No. 6

Aim :- Create, debug and execute program based on RMI (Client Server Communication)

Theory :-

RMI is a mechanisms that allows an object residing in one system to access an object running on another JVM

RMI is used to build distributed application, it provides remote communication between Java programs. It is provided in the package java.rmi

Working of an RMI application.

- When the client makes a call to the remote object, it is received by the stub which eventually passes this request to the RRL
- When the client-side RRL receives the request, it invokes a method called invoke() at the object remote Ref. It passes the request in the RRL on the server side.
- The RRL on the server side passes the request to the skelaton on the server which finally invokes the required object on the server
- The result is passed all the way back to client.

Client Program :

```
import java.awt.event.ActionEvent;
import java.awt.event.ActionListener;
import javax.swing.JButton; import
javax.swing.JFrame; import
javax.swing.JLabel; import
javax.swing.JTextField; import
java.rmi.NotBoundException; import
java.rmi.RemoteException; import
java.rmi.registry.LocateRegistry; import
java.rmi.registry.Registry; import
java.util.Scanner; import
java.awt.Color;

class Swing extends JFrame implements ActionListener {

   JButton jb1;
   JTextField jt1;
   JLabel lbl, lb3;

   Swing() {

         lb3 = new JLabel("Enter number");
      lb3.setForeground(Color.WHITE);
lb3.setBounds(160, 50, 150, 60);       add(lb3);

      jt1 = new JTextField();
jt1.setBounds(160, 100, 150, 30);       add(jt1);
```

```
      lbl = new JLabel("Result :");
lbl.setForeground(Color.WHITE);        lbl.setBounds(160,
140, 150, 30);
      add(lbl);



      jb1 = new JButton("Check");
jb1.setBounds(160, 200, 100, 30);        add(jb1);

      jb1.addActionListener(this);

      setLayout(null);        setSize(600, 400);
setVisible(true);        setTitle("Prime Number");
getContentPane().setBackground(Color.BLACK);
   }

   public void actionPerformed(ActionEvent e)
{
           try
           {
           Registry reg = LocateRegistry.getRegistry("localhost",3333);
      prime pd = (prime)reg.lookup("Hii Server");
int a = Integer.parseInt(jt1.getText());

      String c;
```

```
      if (e.getSource().equals(jb1)) {           c =
pd.prime(a);           lbl.setText("Result : "+
String.valueOf(c));
lbl.setForeground(Color.WHITE);
      }
           }catch(RemoteException p)
           {
                 System.out.println("Exception"+e);
           }catch(NotBoundException q)
           {
                 System.out.println("Exception"+e);
           }
   }

   public static void main(String args[]) throws RemoteException ,NotBoundException
   {
      Swing t = new Swing();

   }
}
```

Server Program :

```
import java.rmi.RemoteException; import
java.rmi.registry.LocateRegistry; import
java.rmi.registry.Registry; import
```

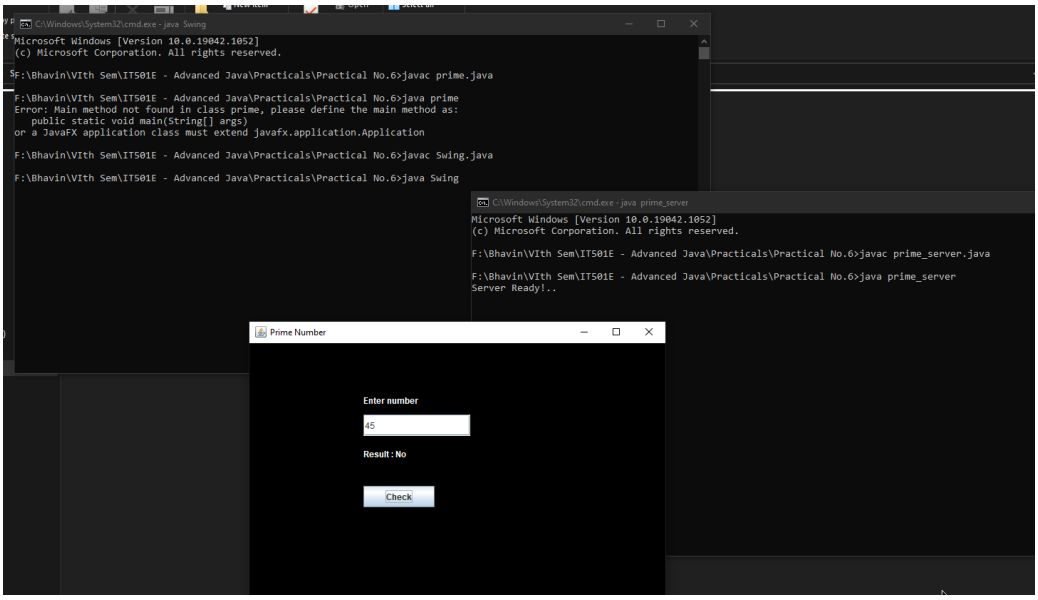
```
java.rmi.server.UnicastRemoteObject;  public class
prime_server extends UnicastRemoteObject
implements prime{     public prime_server() throws
RemoteException
  {
    super();
  }

   //@Ovverride

   public String prime(int n) throws RemoteException {
                    int num = n;
String p = "Noo";
boolean flag = false;
                    for (int i = 2; i <= num / 2; ++i) {
                              // condition for nonprime number
                    if (num % i == 0) {
                                        flag = true;
                                        break;
                              }
                    }
                    if (!flag)
                              p="Yes";
          else
p="No";
                    return p;
                    }

  public static void main(String args[]) throws RemoteException
  {     try
```

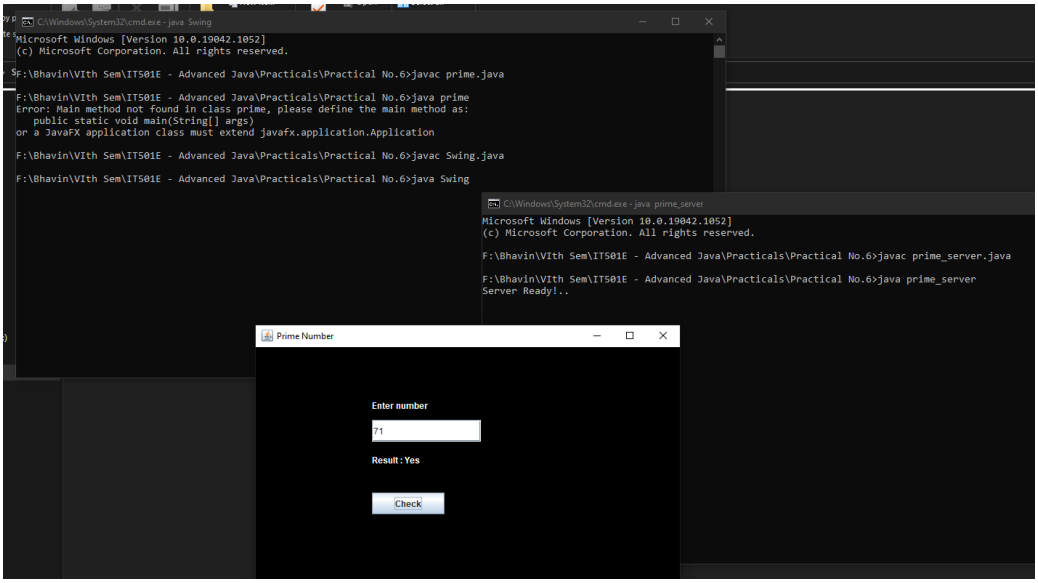
```
{
      Registry reg = LocateRegistry.createRegistry(3333);
reg.rebind("Hii Server", new prime_server());
      System.out.println("Server Ready!..");
    }
    catch(RemoteException e)
    {
       System.out.println("Exception" +e);
    }
   }
}
```

Register Program :

```
  import java.rmi.*; public
interface prime extends Remote
{
   public String prime(int n) throws RemoteException ;
}
```

Outptuts:


C:\Windows\System32\cmd.exe - java Swing
Microsoft Windows [Version 10.0.19042.1052]
(c) Microsoft Corporation. All rights reserved.
F:\Bhavin\VIth Sem\IT501E - Advanced Java\Practicals\Practical No.6>javac prime.java
F:\Bhavin\VIth Sem\IT501E - Advanced Java\Practicals\Practical No.6>java prime
Error: Main method not found in class prime, please define the main method as:
public static void main(String[] args)
or a JavaFX application class must extend javafx.application.Application
F:\Bhavin\VIth Sem\IT501E - Advanced Java\Practicals\Practical No.6>javac Swing.java
F:\Bhavin\VIth Sem\IT501E - Advanced Java\Practicals\Practical No.6>java Swing
C:\Windows\System32\cmd.exe - java prime_server
Microsoft Windows [Version 10.0.19042.1052]
(c) Microsoft Corporation. All rights reserved.
F:\Bhavin\VIth Sem\IT501E - Advanced Java\Practicals\Practical No.6>javac prime_server.java
F:\Bhavin\VIth Sem\IT501E - Advanced Java\Practicals\Practical No.6>java prime_server
Server Ready!..
Prime Number
Enter number
45
Result : No
Check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(c) Microsoft Corporation. All rights reserved.
F:\Bhavin\VIth Sem\IT501E - Advanced Java\Practicals\Practical No.6>javac prime_server.java
F:\Bhavin\VIth Sem\IT501E - Advanced Java\Practicals\Practical No.6>java prime_server
Server Ready!..
Prime Number
Enter number
71
Result : Yes
Check