Department of Software Engineering
Mehran University of Engineering and Technology, Jamshoro

Course: SW422–Distributed Computing

Instructor	Rabeea Jaffari	**Practical/Lab No.**	06
Date		**CLOs**	CLO-3: P5 & CLO-3: P3
Signature		**Assessment Score**	

Topic	To work with RMI-IIOP
Objectives	- Learn programming distributed applications using RMI-IIOP

Lab Discussion: Theoretical concepts and Procedural steps

Lab Tasks
Submission Date:

1. **Create simple RMI IIOP application.**

×	HelloInterface.java	×	HelloServer.java	×	HelloClient.java	×

```java
1 import java.rmi.Remote;
2
3 public interface HelloInterface extends Remote {
4    public String sayHello( String from ) throws java.rmi.RemoteException;
5 }   //16SW04 Jawaria Dhakhan
6
```

×	HelloImpl.java	×	HelloServer.java	×	HelloClient.java	×

```java
1 import javax.rmi.PortableRemoteObject;
2 import java.rmi.RemoteException;
3
4 public class HelloImpl extends PortableRemoteObject implements HelloInterface {
5    public HelloImpl() throws RemoteException {
6        super();     // invoke rmi linking and remote object initialization
7    } //16SW04 Jawaria Dhakhan
8
9    public String sayHello( String from ) throws RemoteException {
10        return  "Hello from " + from + "!!" ;
11
12    }
13 }
14
```

HelloImpl.java × | × **HelloServer.java** × | **HelloClient.java**

```java
1 import javax.naming.InitialContext;
2 import javax.naming.Context;
3 public class HelloServer {
4     public static void main(String[] args) {
5         try {  //16SW04 Jawaria Dhakhan |
6 HelloImpl helloRef = new HelloImpl();
7 Context initialNamingContext = new InitialContext();
8             initialNamingContext.rebind("HelloService", helloRef );
9             System.out.println("Hello Server: Ready...");
10         } catch (Exception e) {
11             System.out.println("Trouble: " + e);
12             e.printStackTrace();
13         } } }
14
```

× **HelloImpl.java** × | **HelloServer.java** × | **HelloClient.java** ×

```java
1 import java.net.MalformedURLException;
2 import javax.rmi.*;
3 import java.rmi.*;
4 import java.util.Vector;
5 import javax.naming.*;
6 import java.io.*;
7
8 public class HelloClient {
9 public static void  main( String args[] ) {
10         Context ic;
11         Object objref;
12         HelloInterface hi;
13
14     //16SW04 Jawaria Dhakhan
15         try {
16             ic = new InitialContext();
17
18 objref = ic.lookup("HelloService");
19             System.out.println("Client: Obtained a ref. to Hello server.");
20
21 hi = (HelloInterface) PortableRemoteObject.narrow(
22             objref, HelloInterface.class);
23             System.out.println(hi.sayHello( " MARS " ));
24 |
25         } catch( Exception e ) {
26             System.err.println( "Exception " + e + "Caught" );
27             e.printStackTrace( );
28             return;
29         } } }
30
```

```
C:\Windows\System32\cmd.exe                                                                    —    □    X

E:\16SW04\task1>javac *.java

E:\16SW04\task1>rmic -iiop HelloImpl

E:\16SW04\task1>start orbd -ORBInitialPort 1050

E:\16SW04\task1>start java -Djava.naming.factory.initial=com.sun.jndi.cosnaming.CNCtxFactory -Djava.naming.provider.url=
iiop://localhost:1050 HelloServer

E:\16SW04\task1> java -Djava.naming.factory.initial=com.sun.jndi.cosnaming.CNCtxFactory -Djava.naming.provider.url=iiop:
//localhost:1050 HelloClient
Client: Obtained a ref. to Hello server.
Hello from  16SW04 !!

E:\16SW04\task1>
```

```
C:\Program Files\Java\jdk1.8.0_151\bin\orbd.exe                                                 —    □    X



C:\Program Files\Java\jdk1.8.0_151\bin\java.exe                                                 —    □    X

Hello Server: Ready...

```

2. Create RMI IIOP application in which take a sentence at runtime on the client application and let the server return its reverse.
   E.g. input could be: subject is distributed computing
   output should be: computing distributed is subject.

HelloInterface.java ×   **HelloImpl.java** ×   **HelloServer.java** ×

```java
1 import java.rmi.Remote;
2
3 public interface HelloInterface extends Remote {
4     public String SentenceReverse( String str) throws java.rmi.RemoteException;
5 } //16SW04 JAWARIA DHAKHAN
```

HelloInterface.java ×   **HelloImpl.java** ×   **HelloServer.java** ×

```java
1 mport javax.rmi.PortableRemoteObject;
2 import java.rmi.RemoteException;
3
4 public class HelloImpl extends PortableRemoteObject implements HelloInterface {
5     public HelloImpl() throws RemoteException {
6         super();      // invoke rmi linking and remote object initialization
7     }   //16SW04 JAWARIA DHAKHAN
8
9     public String SentenceReverse( String str) throws RemoteException {
10         String [] arr=str.split(" ");
11       str=" ";
12       for(int i=(arr.length-1); i>=0; i--)
13       str+=arr[i]+" ";
14       return  str ;
15
16     }
17 }
18
```

```java
1 import javax.naming.InitialContext;
2 import javax.naming.Context;
3 public class HelloServer {
4     public static void main(String[] args) {
5         try { //16SW04 JAWARIA DHAKHAN
6 HelloImpl helloRef = new HelloImpl();
7 Context initialNamingContext = new InitialContext();
8             initialNamingContext.rebind("SentenceReverseService", helloRef );
9             System.out.println("Hello Server: Ready...");
10         } catch (Exception e) {
11             System.out.println("Trouble: " + e);
12             e.printStackTrace();
13         }  }  }
14
```

```java
1 import javax.rmi.*;
2 import java.rmi.*;
3 import java.util.Vector;
4 import javax.naming.*;
5 import java.io.*;
6 public class HelloClient {
7 public static void  main( String args[] ) {
8         Context ic;
9         Object objref;
10        HelloInterface hi;
11 //16SW04 JAWARIA DHAKHAN
12        try {
13            ic = new InitialContext();
14
15 objref = ic.lookup("SentenceReverseService");
16            System.out.println("Client: Obtained a ref. to Hello server.");
17
18 hi = (HelloInterface) PortableRemoteObject.narrow(
19                objref, HelloInterface.class);
20            System.out.println(hi.SentenceReverse( "Hi, I am Jawaria Dhakhan and my Roll Number is 16SW04 " ));
21
22        } catch( Exception e ) {
23            System.err.println( "Exception " + e + "Caught" );
24            e.printStackTrace( );
25            return;
26        } } }
27
```

```
C:\Windows\System32\cmd.exe                                                    —   □   X

E:\16SW04\task2>javac *.java

E:\16SW04\task2>rmic -iiop HelloImpl

E:\16SW04\task2>start orbd -ORBInitialPort 1050

E:\16SW04\task2>start java -Djava.naming.factory.initial=com.sun.jndi.cosnaming.CNCtxFactory -Djava.naming.provider.url=
iiop://localhost:1050 HelloServer

E:\16SW04\task2> java -Djava.naming.factory.initial=com.sun.jndi.cosnaming.CNCtxFactory -Djava.naming.provider.url=iiop:
//localhost:1050 HelloClient
Client: Obtained a ref. to Hello server.
 16SW04 is Number Roll my and Dhakhan Jawaria am I Hi,

E:\16SW04\task2>
```

```
C:\Program Files\Java\jdk1.8.0_151\bin\orbd.exe                                 —   □   X



C:\Program Files\Java\jdk1.8.0_151\bin\java.exe                                 —   □   X
Hello Server: Ready...
▄
```