

## Assignment No.2

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Subject: LP-V (Distributed System)

### Code:

1. Develop the interface code:

```
1. module CalcApp
2. {
3.     interface Calc
4.     {
5.         exception DivisionByZero {};
6.         float sum(in float a, in float b);
7.         float div(in float a, in float b) raises (DivisionByZero);
8.         float mul(in float a, in float b);
9.         float sub(in float a, in float b);10.
10.    };
11. };
12.
```

2. Develop the server side code:

```
1. import CalcApp.*;
2. import CalcApp.CalcPackage.DivisionByZero;
3.
4. import org.omg.CosNaming.*;
5. import org.omg.CosNaming.NamingContextPackage.*;
6. import org.omg.CORBA.*;
7. import org.omg.PortableServer.*;
8.
9. import java.util.Properties;
10.
11. class CalcImpl extends CalcPOA {
12.
13.     @Override
14.     public float sum(float a, float b) {
15.         return a + b;
16.     }
17.
18.     @Override
19.     public float div(float a, float b) throws DivisionByZero {
20.         if (b == 0) {
21.             throw new CalcApp.CalcPackage.DivisionByZero();
22.         } else {
23.             return a / b;
24.         }
25.     }
26.
27.     @Override
28.     public float mul(float a, float b) {
29.         return a * b;
30.     }
31.
32.     @Override
33.     public float sub(float a, float b) {
34.         return a - b;
35.     }
36.     private ORB orb;
37.
38.     public void setORB(ORB orb_val) {
39.         orb = orb_val;
40.     }
41. }
```

```

41. }
42.
43. public class CalcServer {
44.
45.     public static void main(String args[]) {
46.         try {
47.             // create and initialize the ORB
48.             ORB orb = ORB.init(args, null);
49.
50.             // get reference to rootpoa & activate the POAManager
51.             POA rootpoa = POAHelper.narrow(orb.resolve_initial_references("RootPOA"));
52.             rootpoa.the_POAManager().activate();
53.
54.             // create servant and register it with the ORB
55.             CalcImpl helloImpl = new CalcImpl();
56.             helloImpl.setORB(orb);
57.
58.             // get object reference from the servant
59.             org.omg.CORBA.Object ref = rootpoa.servant_to_reference(helloImpl);
60.             Calc href = CalcHelper.narrow(ref);
61.
62.             // get the root naming context
63.             // NameService invokes the name service
64.             org.omg.CORBA.Object objRef = orb.resolve_initial_references("NameService");
65.             // Use NamingContextExt which is part of the Interoperable
66.             // Naming Service (INS) specification.
67.             NamingContextExt ncRef = NamingContextExtHelper.narrow(objRef);
68.
69.             // bind the Object Reference in Naming
70.             String name = "Calc";
71.             NameComponent path[] = ncRef.to_name(name);
72.             ncRef.rebind(path, href);
73.
74.             System.out.println("Ready..");
75.
76.             // wait for invocations from clients
77.             orb.run();
78.         } catch (Exception e) {
79.             System.err.println("ERROR: " + e);
80.             e.printStackTrace(System.out);
81.         }
82.
83.         System.out.println("Exiting ...");
84.     }
85. }
86.
87.

```

### 3. Develop the client-side code:

```

1. import java.io.BufferedReader;
2. import java.io.IOException;
3. import java.io.InputStreamReader;
4.
5. import CalcApp.*;
6. import CalcApp.CalcPackage.DivisionByZero;
7.
8. import org.omg.CosNaming.*;
9. import org.omg.CosNaming.NamingContextPackage.*;
10. import org.omg.CORBA.*;
11. import static java.lang.System.out;
12.
13. public class CalcClient {
14.
15.     static Calc calcImpl;
16.     static BufferedReader br = new BufferedReader(new InputStreamReader(System.in));
17.
18.     public static void main(String args[]) {

```

```

19.
20.     try {
21.         // create and initialize the ORB
22.         ORB orb = ORB.init(args, null);
23.
24.         // get the root naming context
25.         org.omg.CORBA.Object objRef = orb.resolve_initial_references("NameService");
26.         // Use NamingContextExt instead of NamingContext. This is
27.         // part of the Interoperable naming Service.
28.         NamingContextExt ncRef = NamingContextExtHelper.narrow(objRef);
29.
30.         // resolve the Object Reference in Naming
31.         String name = "Calc";
32.         calcImpl = CalcHelper.narrow(ncRef.resolve_str(name));
33.
34.         //             System.out.println(calcImpl);
35.
36.
37.         while (true) {
38.             out.println("1. Sum");
39.             out.println("2. Sub");
40.             out.println("3. Mul");
41.             out.println("4. Div");
42.             out.println("5. exit");
43.             out.println("--");
44.             out.println("choice: ");
45.
46.             try {
47.                 String opt = br.readLine();
48.                 if (opt.equals("5")) {
49.                     break;
50.                 } else if (opt.equals("1")) {
51.                     out.println("a+b= " + calcImpl.sum(getFloat("a"), getFloat("b")));
52.                 } else if (opt.equals("2")) {
53.                     out.println("a-b= " + calcImpl.sub(getFloat("a"), getFloat("b")));
54.                 } else if (opt.equals("3")) {
55.                     out.println("a*b= " + calcImpl.mul(getFloat("a"), getFloat("b")));
56.                 } else if (opt.equals("4")) {
57.                     try {
58.                         out.println("a/b= " + calcImpl.div(getFloat("a"),
59. getFloat("b")));
60.                     } catch (DivisionByZero de) {
61.                         out.println("Division by zero!!!");
62.                     }
63.                 } catch (Exception e) {
64.                     out.println("===");
65.                     out.println("Error with numbers");
66.                     out.println("===");
67.                 }
68.                 out.println("");
69.
70.             }
71.             //calcImpl.shutdown();
72.         } catch (Exception e) {
73.             System.out.println("ERROR : " + e);
74.             e.printStackTrace(System.out);
75.         }
76.     }
77.
78.     static float getFloat(String number) throws Exception {
79.         out.print(number + ": ");
80.         return Float.parseFloat(br.readLine());
81.     }
82. }
83.

```

## Output:

```
Terminal Local (2) Local (3) + v
PS C:\Users\Yash\workspace\Assignment No 02\src> idlj -version
IDL-to-Java compiler (portable), version "3.2"
PS C:\Users\Yash\workspace\Assignment No 02\src> idlj -fall .\calculator.idl
PS C:\Users\Yash\workspace\Assignment No 02\src> cd ..
PS C:\Users\Yash\workspace\Assignment No 02> cd '.\out\production\Assignment No 02\'
PS C:\Users\Yash\workspace\Assignment No 02\out\production\Assignment No 02> ls

Directory: C:\Users\Yash\workspace\Assignment No 02\out\production\Assignment No 02

Mode                LastWriteTime         Length Name
----                -
d-----          24-05-2023    09:29          CalcApp
d-----          24-05-2023    09:29          orb.db
-a----          23-05-2023    14:19        3380 CalcClient.class
-a----          23-05-2023    14:19         895 CalcImpl.class
-a----          23-05-2023    14:19        2557 CalcServer.class
-a----          23-05-2023    12:45         265 calculator.idl
-a----          23-05-2023    14:19         516 Main.class

PS C:\Users\Yash\workspace\Assignment No 02\out\production\Assignment No 02> orbd -ORBInitialPort 1050
```

```
Terminal Local (2) Local (3) + v
Windows PowerShell
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Try the new cross-platform PowerShell https://aka.ms/pscore6

PS C:\Users\Yash\workspace\Assignment No 02> cd '.\out\production\Assignment No 02\'
PS C:\Users\Yash\workspace\Assignment No 02\out\production\Assignment No 02> java CalcServer -ORBInitialPort 1050 -ORBInitialHost localhost
Ready..
```

```
Terminal Local (2) Local (3) + v
Windows PowerShell
Copyright (C) Microsoft Corporation. All rights reserved.

Try the new cross-platform PowerShell https://aka.ms/pscore6

PS C:\Users\Yash\workspace\Assignment No 02> cd '.\out\production\Assignment No 02\'
PS C:\Users\Yash\workspace\Assignment No 02\out\production\Assignment No 02> java CalcClient -ORBInitialPort 1050 -ORBInitialHost localhost
1. Sum
2. Sub
3. Mul
4. Div
5. exit
--
choice:
1
a: 5
b: 8
a+b= 13.0
1. Sum
2. Sub
3. Mul
4. Div
5. exit
--
choice:

```