

Sanyam Agrawal SE21UCSE192 CSE3

DS - Assignment 6

Q-6.1)

Hello.idl

```
module HelloApp {  
    interface Hello {  
        string sayHello();  
    };  
};
```

HelloImpl.java

```
import HelloApp.HelloPOA;  
  
public class HelloImpl extends HelloPOA {  
    @Override  
    public String sayHello() {  
        return "Hello from the CORBA server!! Sanyam Agrawal - SE21UCSE192 -  
CSE3";  
    }  
}
```

Server.java

```
import org.omg.CORBA.*;  
import org.omg.PortableServer.*;  
import org.omg.CosNaming.*;  
import org.omg.CosNaming.NamingContextExtPackage.*;  
  
public class Server {  
    public static void main(String[] args) {  
        try {  
            // Initialize the ORB (Object Request Broker)  
            ORB orb = ORB.init(args, null);  
  
            // Get reference to the RootPOA and activate the POAManager
```

```

        POA rootpoa =
POAHelper.narrow(orb.resolve_initial_references("RootPOA"));
        rootpoa.the_POAManager().activate();

        // Create the implementation object
        HelloImpl helloImpl = new HelloImpl();

        // Get the object reference from the servant
        org.omg.CORBA.Object ref = rootpoa.servant_to_reference(helloImpl);
        HelloApp.Hello href = HelloApp.HelloHelper.narrow(ref);

        // Bind the object reference in the Naming Service
        org.omg.CORBA.Object objRef =
orb.resolve_initial_references("NameService");
        NamingContextExt ncRef = NamingContextExtHelper.narrow(objRef);

        String name = "Hello";
        NameComponent[] path = ncRef.to_name(name);
        ncRef.rebind(path, href);

        System.out.println("Server ready and waiting...");

        // Wait for invocations from clients
        orb.run();
    } catch (Exception e) {
        System.err.println("Error: " + e);
        e.printStackTrace(System.out);
    }
}
}

```

Client.java

```

import org.omg.CORBA.*;
import org.omg.CosNaming.*;
import org.omg.CosNaming.NamingContextExtPackage.*;

import HelloApp.Hello;
import HelloApp.HelloHelper;

public class Client {
    public static void main(String[] args) {
        try {
            // Initialize the ORB

```

```

        ORB orb = ORB.init(args, null);

        // Get a reference to the Naming Service
        org.omg.CORBA.Object objRef =
orb.resolve_initial_references("NameService");
        NamingContextExt ncRef = NamingContextExtHelper.narrow(objRef);

        // Resolve the object reference in the Naming Service
        String name = "Hello";
        Hello helloImpl = HelloHelper.narrow(ncRef.resolve_str(name));

        // Call the sayHello method
        String response = helloImpl.sayHello();
        System.out.println("Response from server: " + response);
    } catch (Exception e) {
        System.err.println("Error: " + e);
        e.printStackTrace(System.out);
    }
}
}

```

Output:

Generating Java Stubs and Skeletons->

```

sanyam@SANYAM:~/DS_Lab_192/Lab6_DS$ idlj -fall Hello.idl
sanyam@SANYAM:~/DS_Lab_192/Lab6_DS$ javac -Xlint:unchecked *.java

```

Starting the ORBD (Object Request Broker Daemon)->

```

sanyam@SANYAM:~/DS_Lab_192/Lab6_DS$ orbd -ORBInitialPort 1050

```

Running the Server->

```

sanyam@SANYAM:~/DS_Lab_192/Lab6_DS$ java Server -ORBInitialPort 1050 -ORBInitialHost localhost
Server ready and waiting...

```

Running the Client->

```
sanyam@SANYAM:~/DS_Lab_192/Lab6_DS$ java Client -ORBInitialPort 1050 -ORBInitialHost localhost
Response from server: Hello from the CORBA server!! Sanyam Agrawal - SE21UCSE192 - CSE3
sanyam@SANYAM:~/DS_Lab_192/Lab6_DS$
```

Q-6.2)

Studentrecords.xsd: The schema will define the structure for student records

```
<?xml version="1.0" encoding="UTF-8"?>
<xs:schema xmlns:xs="http://www.w3.org/2001/XMLSchema">

  <!-- Simple type for Roll Number (numeric, fixed length) -->
  <xs:simpleType name="RollNumberType">
    <xs:restriction base="xs:string">
      <xs:pattern value="\d{6}"/>
    </xs:restriction>
  </xs:simpleType>

  <!-- Complex type for Subject -->
  <xs:complexType name="SubjectType">
    <xs:sequence>
      <xs:element name="SubjectName" type="xs:string"/>
      <xs:element name="Grade" type="xs:string"/>
    </xs:sequence>
  </xs:complexType>

  <!-- Complex type for Student -->
  <xs:complexType name="StudentType">
    <xs:sequence>
      <xs:element name="Name" type="xs:string"/>
      <xs:element name="RollNumber" type="RollNumberType"/>
      <xs:element name="Department" type="xs:string"/>
      <xs:element name="Subjects" minOccurs="1" maxOccurs="unbounded">
        <xs:complexType>
          <xs:sequence>
            <xs:element name="Subject" type="SubjectType"
maxOccurs="unbounded"/>
          </xs:sequence>
        </xs:complexType>
      </xs:element>
    </xs:sequence>
  </xs:complexType>
</xs:schema>
```

```

        </xs:complexType>
    </xs:element>
</xs:sequence>
    <xs:attribute name="ID" type="xs:ID" use="required"/>
</xs:complexType>

<!-- Root element (StudentRecords) containing multiple students -->
<xs:element name="StudentRecords">
    <xs:complexType>
        <xs:sequence>
            <xs:element name="Student" type="StudentType" maxOccurs="unbounded"/>
        </xs:sequence>
    </xs:complexType>
</xs:element>

</xs:schema>

```

Studentrecords.xml: This XML document will represent an instance of student records:

```

<?xml version="1.0" encoding="UTF-8"?>
<StudentRecords xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
    xsi:noNamespaceSchemaLocation="studentrecords.xsd">

    <Student ID="S001">
        <Name>Alice Johnson</Name>
        <RollNumber>123456</RollNumber>
        <Department>Computer Science</Department>
        <Subjects>
            <Subject>
                <SubjectName>Data Structures</SubjectName>
                <Grade>A</Grade>
            </Subject>
            <Subject>
                <SubjectName>Operating Systems</SubjectName>
                <Grade>B+</Grade>
            </Subject>
        </Subjects>
    </Student>

    <Student ID="S002">

```

```
<Name>Bob Smith</Name>
<RollNumber>654321</RollNumber>
<Department>Mechanical Engineering</Department>
<Subjects>
  <Subject>
    <SubjectName>Thermodynamics</SubjectName>
    <Grade>B</Grade>
  </Subject>
  <Subject>
    <SubjectName>Fluid Mechanics</SubjectName>
    <Grade>A</Grade>
  </Subject>
</Subjects>
</Student>

</StudentRecords>
```