**PowerService.java (Interface)**

java

CopyEdit

import java.rmi.Remote;

import java.rmi.RemoteException;

public interface PowerService extends Remote {

long powerOfTwo(int exponent) throws RemoteException;

}

**2️⃣ PowerServiceImpl.java (Remote Object)**

java

CopyEdit

import java.rmi.server.UnicastRemoteObject;

import java.rmi.RemoteException;

public class PowerServiceImpl extends UnicastRemoteObject implements PowerService {

public PowerServiceImpl() throws RemoteException {

super();

}

@Override

public long powerOfTwo(int exponent) throws RemoteException {

return (long) Math.pow(2, exponent);

}

}

**3️⃣ PowerServer.java**

java

CopyEdit

import java.rmi.registry.LocateRegistry;

import java.rmi.registry.Registry;

public class PowerServer {

public static void main(String[] args) {

try {

PowerService service = new PowerServiceImpl();

Registry registry = LocateRegistry.createRegistry(1099); // or your custom port

registry.rebind("PowerService", service);

System.out.println("Power RMI Server is ready...");

} catch (Exception e) {

e.printStackTrace();

}

}

}

**4️⃣ PowerClient.java**

java

CopyEdit

import java.rmi.registry.LocateRegistry;

import java.rmi.registry.Registry;

import java.util.Scanner;

public class PowerClient implements Runnable {

private final int exponent;

public PowerClient(int exponent) {

this.exponent = exponent;

}

public void run() {

try {

Registry registry = LocateRegistry.getRegistry("localhost", 1099); // Use server IP if remote

PowerService stub = (PowerService) registry.lookup("PowerService");

long result = stub.powerOfTwo(exponent);

System.out.println("2^" + exponent + " = " + result);

} catch (Exception e) {

e.printStackTrace();

}

}

public static void main(String[] args) {

// Sample test with multiple threads

for (int i = 1; i <= 5; i++) {

Thread t = new Thread(new PowerClient(i));

t.start();

}

}

}

**✅ Compilation & Running**

bash

CopyEdit

# Compile all Java files

javac \*.java

# Start the RMI registry (keep in background)

start rmiregistry

# Start server

java PowerServer

# On client machine or same machine

java PowerClient