

## Practical No. 4

### Use of middleware: RMI

1. Make sure you have Java version 1.8 with rmi registry.exe in bin folder, check for the same.

2. Create a new java project --> RMI\_Demo

3. Right click on project and add new Interface --> IHello (Write interface code)

4. Paste below code in IHello.java

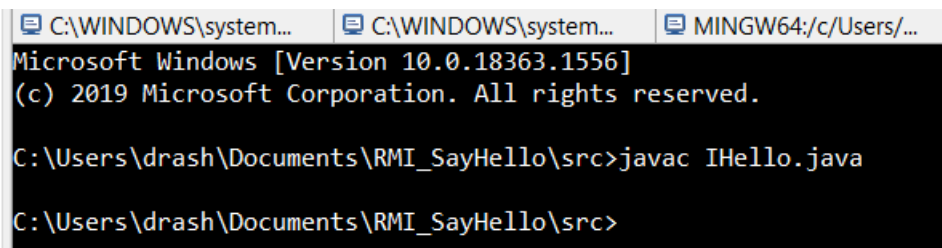
```
import java.rmi.*;

public interface IHello extends Remote{

    public String message() throws RemoteException;

}
```

5. Right click on IHello.java --> Show in Local terminal --> Terminal and when console opens compile your code as follows:



The screenshot shows a Windows terminal window with the following text:

```
C:\WINDOWS\system... C:\WINDOWS\system... MINGW64:/c/Users/...
Microsoft Windows [Version 10.0.18363.1556]
(c) 2019 Microsoft Corporation. All rights reserved.

C:\Users\drash\Documents\RMI_SayHello\src>javac IHello.java

C:\Users\drash\Documents\RMI_SayHello\src>
```

6. Add new class --> HelloImpl.java (write implementation code)

7. Paste below code in HelloImpl.java:

```
import java.rmi.*;
import java.rmi.server.*;

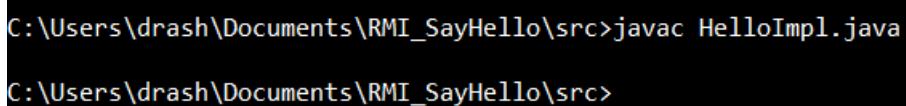
public class HelloImpl extends UnicastRemoteObject
    implements IHello{

    public HelloImpl() throws RemoteException {
        //There is no action need in this moment.
    }

    public String message() throws RemoteException {
        return ("Hello");
    }

}
```

8. Compile the HelloImpl.java as follows:



The screenshot shows a Windows terminal window with the following text:

```
C:\Users\drash\Documents\RMI_SayHello\src>javac HelloImpl.java

C:\Users\drash\Documents\RMI_SayHello\src>
```

## 9. Add class HelloServer and paste below code:

```
import java.rmi.*;

public class HelloServer {

    private static final String host = "localhost";

    public static void main(String[] args) throws Exception {
        /** Step 1
         /** Declare a reference for the object that will be implemented
        HelloImpl temp = new HelloImpl();

        /** Step 2
        /** Declare a string variable for holding the URL of the object's name
        String rmiObjectName = "rmi://" + host + "/Hello";

        /**Step 3
        /**Binding the object reference to the object name.
        Naming.rebind(rmiObjectName, temp);

        /**Step 4
        /**Tell to the user that the process is completed.
        System.out.println("Binding complete...\n");
    }
}
```

## 10. Compile server class.

## 11. Add class HelloClient and paste below code:

```
import java.rmi.ConnectException;
import java.rmi.Naming;

public class HelloClient
{
    private static final String host = "localhost";

    public static void main(String[] args)
    {
        try
        {
            /**We obtain a reference to the object from the registry and next,
            /**it will be typecasted into the most appropriate type.
            IHello greeting_message = (IHello) Naming.lookup("rmi://"
                + host + "/Hello");

            /**Next, we will use the above reference to invoke the remote
            /**object method.
            System.out.println("Message received: " +
                greeting_message.getGreetingMessage());
        }
        catch (ConnectException conEx)
        {
            System.out.println("Unable to connect to server!");
            System.exit(1);
        }
        catch (Exception ex)
        {
            ex.printStackTrace();
        }
    }
}
```

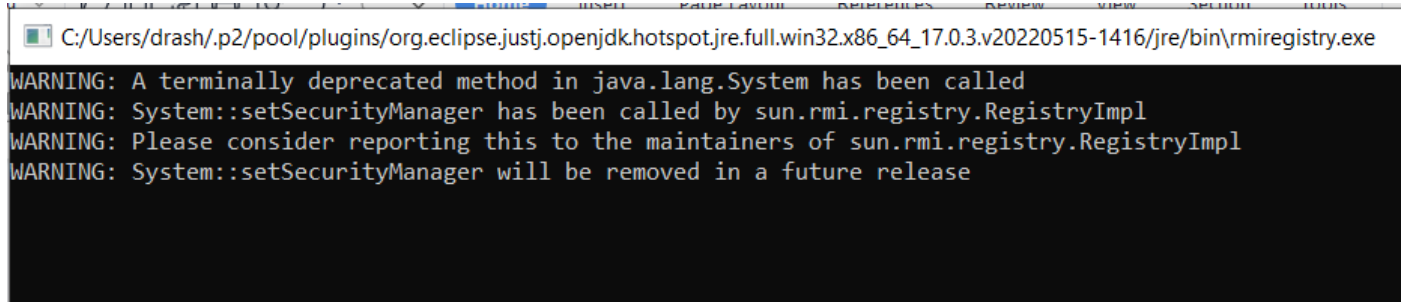
```
        System.exit(1);
    }
}
```

**12. Compile client class.**

**13. Start the rmi registry as follows:**

```
C:\Users\drash\Documents\RMI_SayHello\src>start rmiregistry
C:\Users\drash\Documents\RMI_SayHello\src>
```

**It starts another console which gets displayed as follows:**



```
C:/Users/drash/.p2/pool/plugins/org.eclipse.justj.openjdk.hotspot.jre.full.win32.x86_64_17.0.3.v20220515-1416/jre/bin/rmiregistry.exe
WARNING: A terminally deprecated method in java.lang.System has been called
WARNING: System::setSecurityManager has been called by sun.rmi.registry.RegistryImpl
WARNING: Please consider reporting this to the maintainers of sun.rmi.registry.RegistryImpl
WARNING: System::setSecurityManager will be removed in a future release
```

**14. Now run the Client code as follows:**

```
C:\Users\drash\Documents\RMI_Hello_new\src>java HelloClient.java

java.rmi.NotBoundException: Hello
```