

CS25610 / CSM5610 Worksheet Two 1999-00

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1 Introduction

This worksheet is intended to be a simple first introduction to the production of programs that make use of Java Remote Method Invocation (RMI).

You will need to consult your lecture notes and online manuals during this practical.

2 Your Task

This worksheet uses the same essential scenario as used on worksheet one, namely it asks you to produce first a “client” program and then later a “server” program. The problem being solved is again an extension of the PoemServer example presented in lectures.

For this worksheet however, your clients and servers will use Java RMI to communicate with each other.

I provide a sample RMI version of the Poem server which is running on the computer moin.dcs.aber.ac.uk. The rmiregistry is running on moin on port 8000 and the Poem Server’s RMI service name is PoemServer.

3 The RMI PoemService Protocol

The protocol is very simple. The server can be contacted by looking up an rmi service via the registry on port 8000 on moin.dcs.aber.ac.uk and by asking for the PoemService.

Assuming your lookup is correct, you will be returned an object which implements a Java Interface called PoemInterface. A copy of the Java source code for this interface is included at the end of this worksheet and can also be downloaded from

http://www.aber.ac.uk/dap/rmi_poem/PoemInterface.java

As can be seen from the interface code, the remotely accessible objects support three methods.

The first method, `getNumber()` returns the number of poems available from the server.

The second method takes an int parameter and returns an array of strings. Each string in the array contains one line of the poem.

The third method returns an array of strings. The strings in the array contain the titles of the available poems.

4 The Client Program

You should construct a client program that can contact my sample RMI server and make appropriate method calls and display the returned results.

The client program should commence by prompting the user for a hostname and RMI port number to contact to reach the PoemServer.

The client program should then prompt the user for requests.

The client program should enable the user to specify a request by some other means that you define. Your client program should analyse the user's request and make appropriate method calls to the RMI Poem Server, displaying the results returned. The user should be allowed to type a sequence of requests and see their respective results via a single run of your client program.

5 The Server Program

When you have completed your client program, you should then attempt to develop a server which also implements the PoemInterface interface and which can be called via RMI.

After compiling your server you will need to run the "rmic" program against your server class to produce the skeletons and stubs. Your client needs to be able to find the stubs and the interface files when manipulating remote object references from the server. You can either place all your server class files, including your stubs in an area on the web, or perhaps more simply, make your stubs available on the CLASSPATH used by the client. If you place the files on the web you will need to specify the java.rmi.server.codebase parameter when starting the server.

To run your server you will need to start a copy of the RMI registry on your computer and then start your server. Make sure you ONLY start one registry and please make sure you kill it before logging off the workstation. You may need to experiment a couple of times to locate a "port number" not in use if the default port number is already in use by another application.

6 Effort Allocated to the Worksheet

It is unlikely that you will complete all of this worksheet in your two hour practical this week. You should expect to spend some "own time" work to complete the worksheet. Another, new worksheet will be provided for the practical next week.

7 Assessment of this Worksheet

These worksheets for the modules CS25610 and CSM5610 are NOT assessed.

The worksheets and the demonstrated practicals are provided as part of the educational offering of the module. The examination questions for these modules may be based on material covered in practicals in addition to lecture material and background reading drawn to your attention by the lecturers or by links on the course materials web site.

8 PoemInterface.java

```
public interface PoemInterface extends java.rmi.Remote {  
  
    public int getNumber() throws java.rmi.RemoteException;  
    public String [] getPoem(int poemNumber) throws java.rmi.RemoteException;  
    public String [] getTitles() throws java.rmi.RemoteException;  
}
```