SE3020 – Distributed Systems
Lab 2 – Java RMI

1. Download and extract the lab 2 code from Courseweb to a local directory.

2. Open the command terminal and go to the same directory where you have extracted the code.

3. Compile the source files using 'javac *.java' command.

4. Start the rmiregistry using the command ' start rmiregistry '.

5. Open another command terminal and go to the same directory to run the server.

> java MathServer

6. Open another command terminal and run the client. Observer how the server and client operates. You may run multiple clients.

> java MathClient

> Close the client and server and rmiregistry.

7. In MathServer.java, uncomment the code section in the *divide* function that has a long running loop and run the server and client again.

Create multiple clients to observe that the RMI Server is handling multiple clients concurrently (and how the synchronous / blocking communication blocks clients).

8. Add a global variable to the MathServer class to keep the count of the clients connected.

Add another remote function to increment the count whenever a client is connected and return the current client count.

You may call this function from the client as the first function before doing any calculations.

Run multiple clients again and see how the client count increases.

How can you ensure the thread safety of the increment count function, which updates a shared variable? Make sure the increment client count function is thread safe.

9. What does the count increment feature say about the Server object's instantiation method?

Is it Singleton, Per client or Per call instantiation?

Briefly explain how can you make this a Per client or Per call instantiation?

> (Hint: you can have multiple server objects and the Math Server object can have associations with other objects).

Submission

Add detailed comments to the newly added code.

Compress the resulting project to a zip file and rename the zip file name to your registration ID.

You may write the answers to the questions in a readme.txt file in the same directory and add it to the zip file.

Upload the zip file to the provided link on courseweb.

e.g. ITXXXXXX.zip