Com S 430  
Spring 2014  
Homework 4

Please leave the formatting alone for the parts of the code that you don't modify (that makes it easier to run a diff utility if we need to).

1. In the examples/csharp directory is an archive Client.zip. This is a VS project including three files, IDatabase.cs, Client.cs, and DatabaseProxy.cs. It is a rehash in C# of a familiar example from homework 1. To try it out, run SimpleServer.java (in hw1.zip if you don't have it already).

Your task is to create three additional versions of Client.cs.

- Use an auxiliary thread to do the database lookup. Add synchronization as necessary to eliminate race conditions. This should be similar to ClientWithSync.java (found in the examples/callbacks directory).

- Use BeginInvoke and EndInvoke in a manner analogous to the usage in the ClientWithFuture.java example (found in the examples/callbacks directory). Note that we are not modifying IDatabase or DatabaseProxy for this, just the client.

- Use BeginInvoke and EndInvoke in a manner analogous to the usage in the ClientWithCallback.java example, using the C# type AsyncCallback. Note that we are not modifying IDatabase or DatabaseProxy for this, just the client.

2. The class Workspace is a kind of sketch for an IDE containing components such as text editors. We want to make the Workspace class serializable as a way of saving the user's session. However, we cannot serialize the static Parser instance and we do not want to serialize the cache of parsed syntax trees (assume that the syntax trees are only to be recreated individually on demand). Make this work and try it out. The Workspace class will need to override the readObject and writeObject methods to customize the serialization process. There is a nice simple example of how this works here:

http://www.byteslounge.com/tutorials/java-custom-serialization-example