Lab 4: Sockets and Multi-client Architecture

SE 3313A

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# Questions

1. The methods with which to interact with the sockets are different, but they still operate on the same principles (IP address, port to connect; read and write bytes to the sockets).
2. The act of reading from a socket requires data to come in from over the network, which would cause a block until the data arrived. Android refuses to let the thread that processes UI message block or it would freeze the UI while the thread was blocked.
3. Lab 2 did not need a persistent connection, while Lab 4 required a persistent connection, which also changed how we interacted with it. In Lab 2 I could use higher-level network objects that handled things like HTTP negotiation, while Lab 4’s raw sockets gave no such assistance.
4. For such a complex application, such low-level access to the socket is not necessary, nor recommended. Too many things have to be considered (e.g. lost connections that have to be detected manually with heartbeats, etc.).
5. No. With one thread having to dispatch messages to each client one at a time, and one thread reading messages from one socket at a time, messages will come in faster than the server can send them to clients and the system will become unusably slow.

# Feedback

1. I understood the document and I used some of the suggestions and tips for implementation.
2. I was lost a lot, and the document didn’t help me understand how to set up the server’s structure, nor help me understand how to shuttle information around between MainActivity and the fragments in a proper way. I ended up trying things at random and hacking solutions together.
3. I can see how the topics are useful. Network communications are pretty much essential in 2016.
4. The complex nature of Android made this lab painful, and made it hard to see what the main focus of the lab was. In comparison, the server wasn’t too bad; it made more sense where synchronization was needed, it was easier to see how the Visitor pattern worked, etc. It would have been a bit better if the front-end of the Android app was completely done and just made calls back to classes that we had to implement that would focus completely on reading/writing sockets and visiting the read data.

P.S.: Please pardon the poor code on the Android side. 4am me is not proud of it either.