

Objective

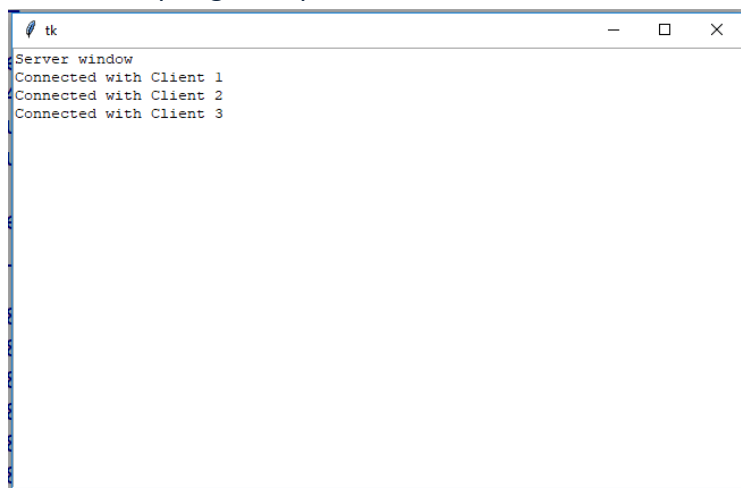
- Exposure to Consistency Models
- Experience with Push/ Pull
- Experience with Invalidation Protocols
- Further experience with Sockets and Uploading and Downloading files

Working

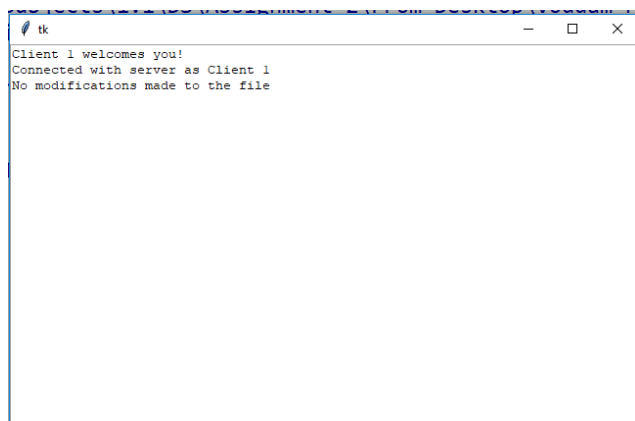
- All clients begin with a single, identical *.txt* file.
- A simple text editor is used to modify the contents of *.txt* file on any individual client.
- Now the copies of *.txt* files are said to be *inconsistent*.
- The particular client automatically detects the file update and *Pushes* those updates to the Server.
- The Server, upon receiving file update from a client, issues *Invalidation Notices* to the remaining clients.
- Upon receipt of *Invalidation Notice*, the clients Pulls the updates from Server and update their local copy.
- Now the copies of *.txt* files are said to be *Consistent* across the clients.
- This process is repeated as required until the program is killed.

Screen-shots:

Server accepting multiple clients:

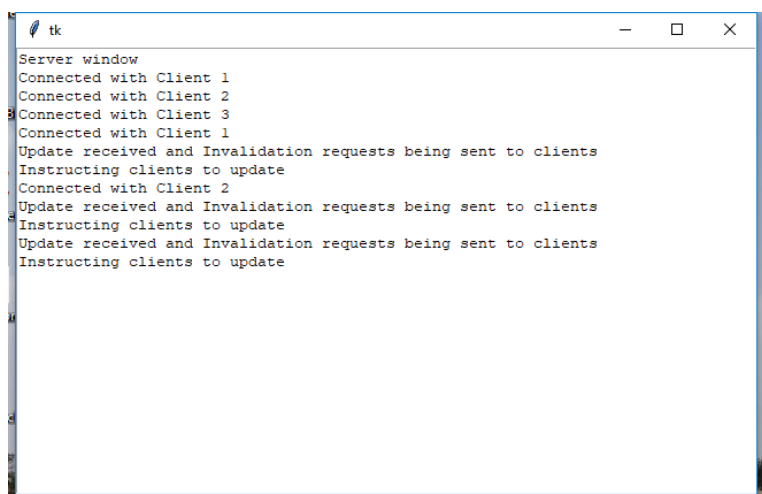


Client 1 monitoring its' directory:



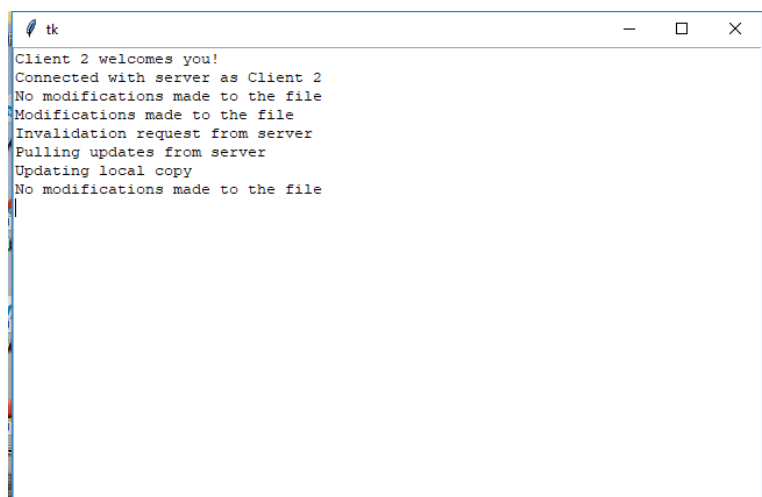
```
tk
Client 1 welcomes you!
Connected with server as Client 1
No modifications made to the file
```

Invalidation request from Server upon editing Client 2s' .txt file:



```
tk
Server window
Connected with Client 1
Connected with Client 2
Connected with Client 3
Connected with Client 1
Update received and Invalidation requests being sent to clients
Instructing clients to update
Connected with Client 2
Update received and Invalidation requests being sent to clients
Instructing clients to update
Update received and Invalidation requests being sent to clients
Instructing clients to update
```

Client 2 updating its local copy:



```
tk
Client 2 welcomes you!
Connected with server as Client 2
No modifications made to the file
Modifications made to the file
Invalidation request from server
Pulling updates from server
Updating local copy
No modifications made to the file
```

IP and Port Descriptions

- IP address: 127.0.0.1
- Port number: 2346

References:

- <https://www.safaribooksonline.com/library/view/python-cookbook/0596001673/ch09s07.html>
- <https://docs.python.org/3/library/xmlrpc.server.html#module-xmlrpc.server>
- <https://scorython.wordpress.com/2016/06/27/multithreading-with-tkinter/>
- <https://docs.python.org/3/library/thread.html>
- <http://thepythonguru.com/python-strings/>
- <https://automatetheboringstuff.com/chapter8/>
- https://www.reddit.com/r/learnpython/comments/2rpk0k/how_to_update_your_gui_in_tkinter_after_using/
- <https://stackoverflow.com/questions/29158220/tkinter-understanding-mainloop>
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- <https://docs.python.org/3/library/xmlrpc.html>
- <https://www.guru99.com/reading-and-writing-files-in-python.html>
- <https://stackoverflow.com/questions/11469228/python-replace-and-overwrite-instead-of-appending#>
- <http://stupidpythonideas.blogspot.com/2013/10/why-your-gui-app-freezes.html>
- <https://www.odoo.com/forum/help-1/question/error-while-trying-to-connect-to-xml-rpc-solved-94868>
- <https://stackoverflow.com/questions/49220464/passing-arguments-in-tkinters-protocolwm-delete-window-function-on-python#>