Report for Assignment 1, P434-SP22 Distributed Systems

Design Details:

As requested by the original assignment details, the database used in this simple KV-store is a written text file named “database.txt”.

For both server.py and client.py I have utilized a simple TCP/IP connection with socket programming through the python socket interface. The client(s) and server should be able to talk to each other through the host IP.

For server.py, I have implemented a multi-thread connection so as to allow multiple clients to connect to the server. This also allows for information to be updated in real time through the database.txt file, which is the written database. I have implemented get and set methods to update the database.txt file in real time, so when clients try to update them simultaneously, the database is updated accordingly.

For client.py, I have implemented a simple send function that sends messages to the server and waits for a reply, processing the reply and the client output with a while loop.

Logs/Screenshots:

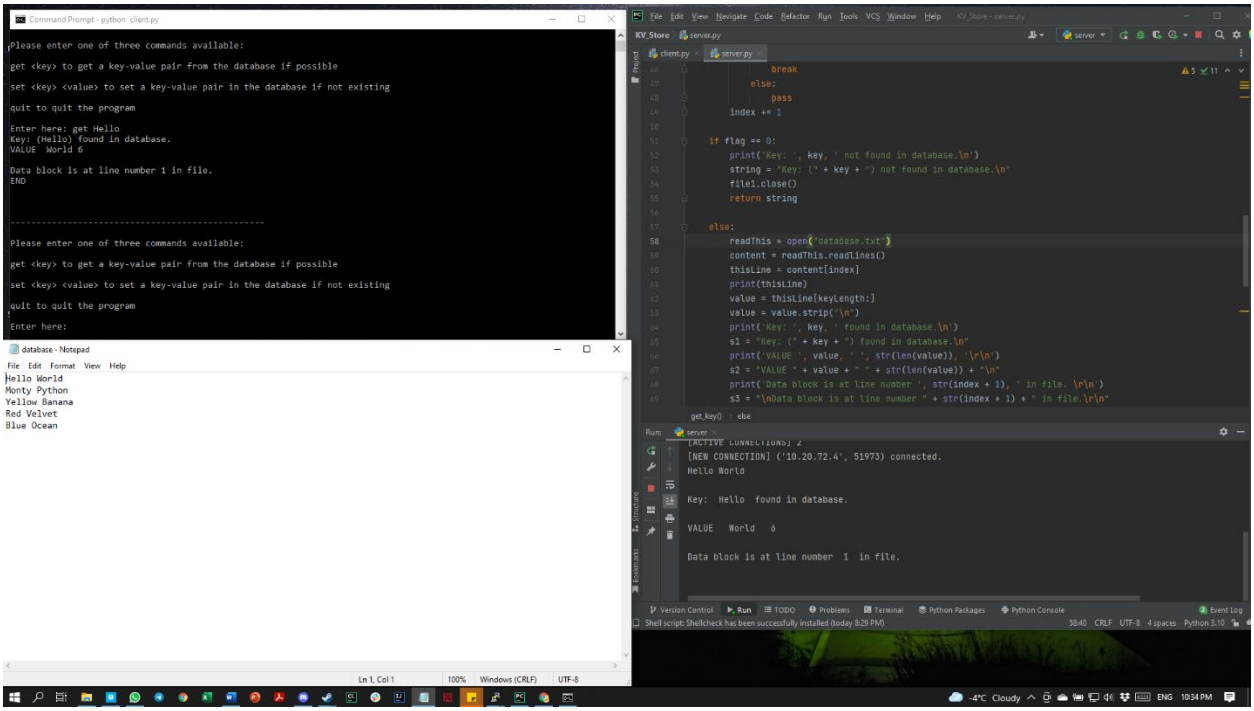

Figure 1: 1-client get function

From Figure 1, we can see that the get function works as intended, as I am able to get Hello from the database to return the value World. The server also outputs print statements to reflect the updates from the client.

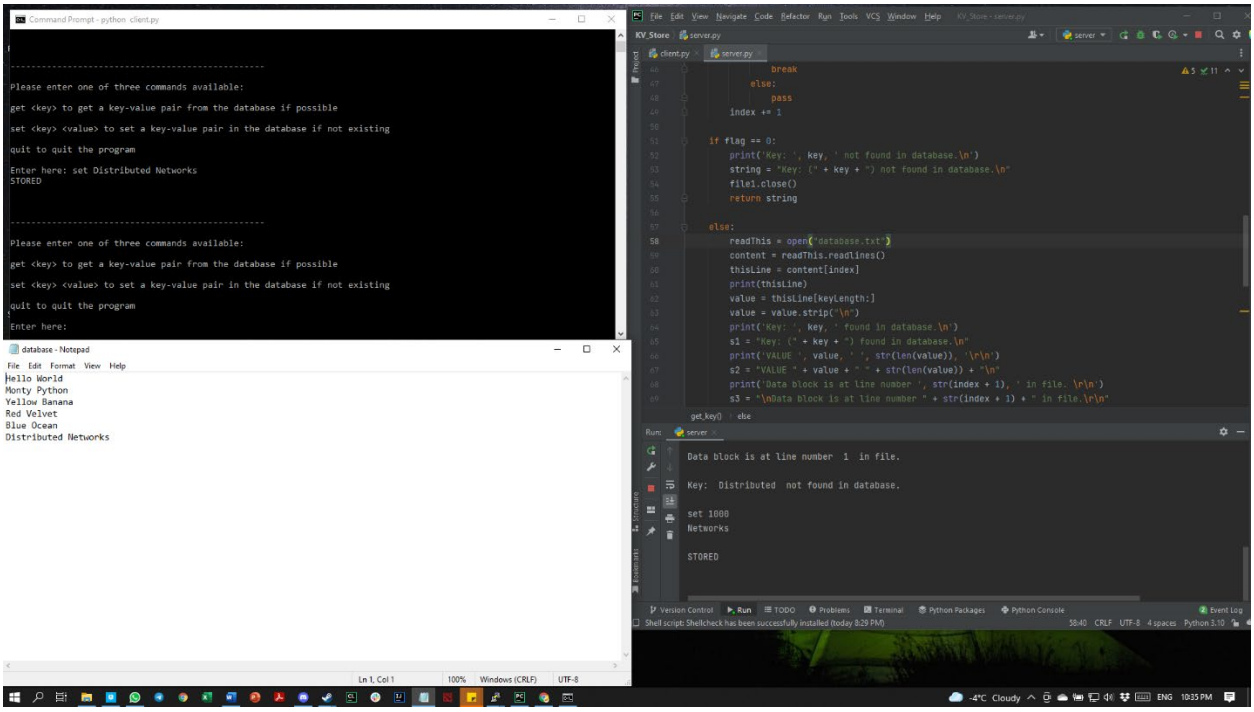

Figure 2: 1-client set function

From Figure 2, we can see that utilizing the set function implemented works. Here, I implemented set Distributed Networks with the format set <key> <value>, and the database is uploaded as intended. The server also outputs print statements to reflect the updates from the client.

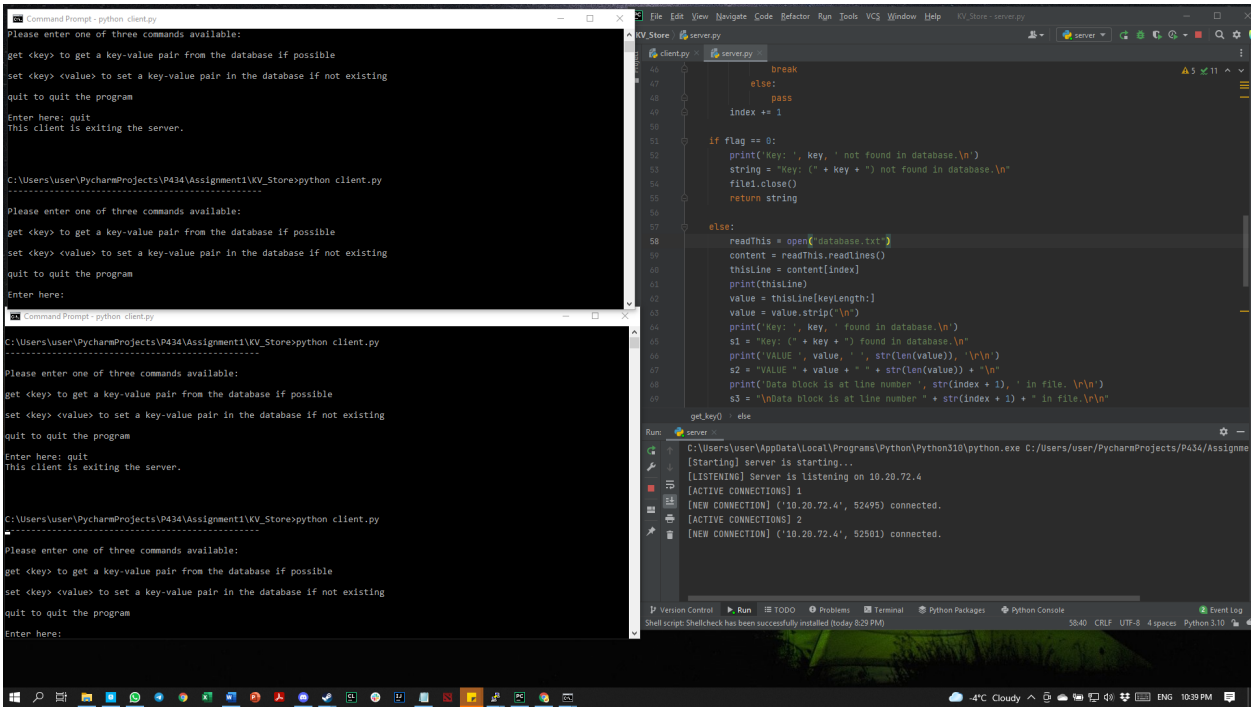

Figure 3: n-client login

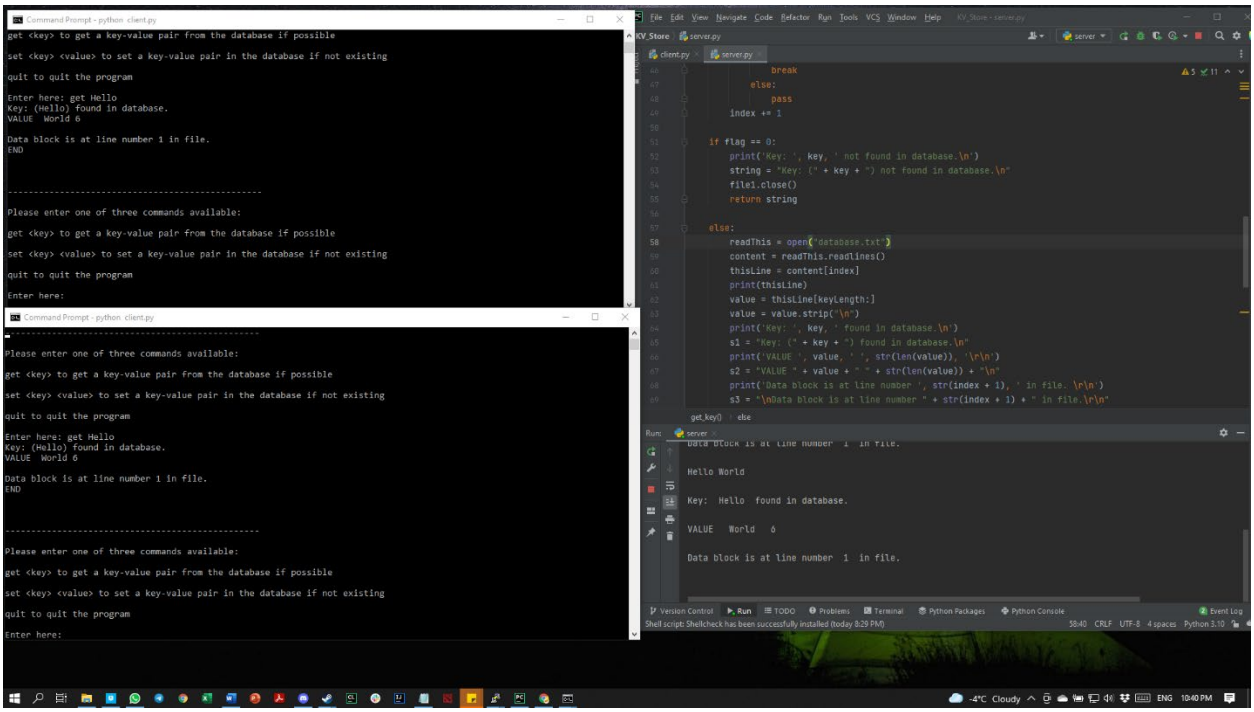

Figure 4: n-client get

Looking at both figures 3 and 4, we can see that a multi-client login and get function implementation is working as intended, and it works for larger number of clients as well.

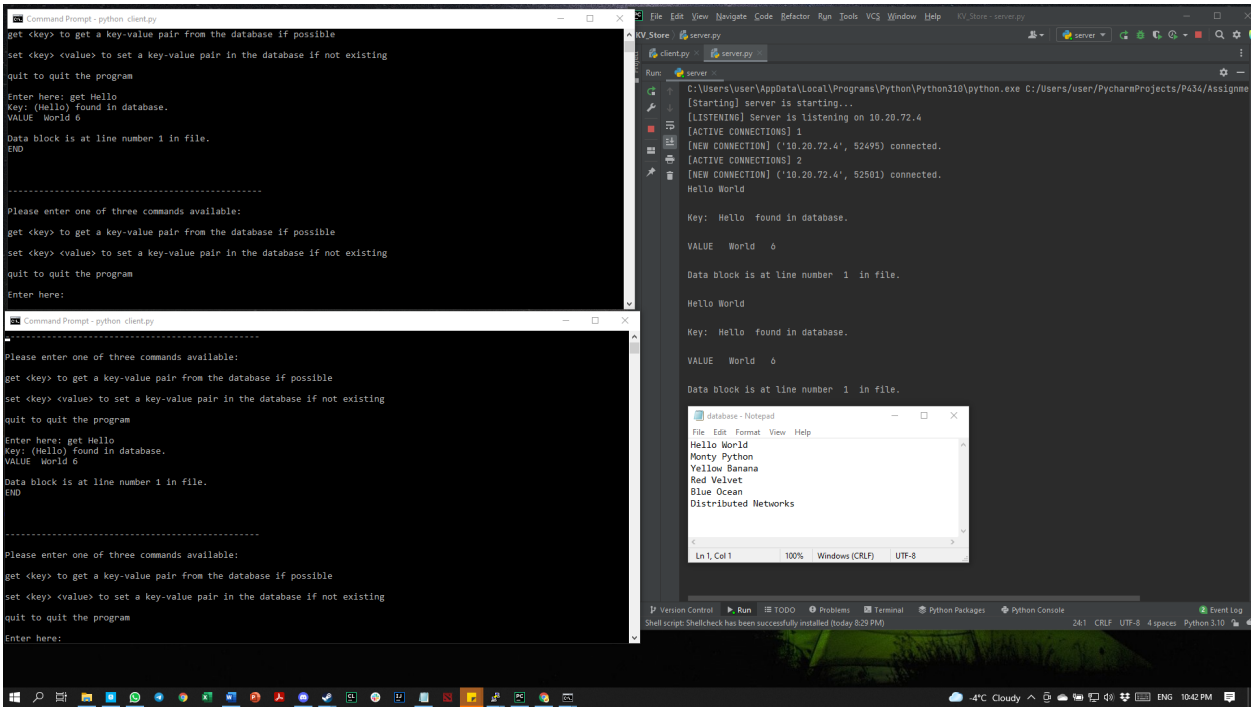

Figure 5: n-client set, before

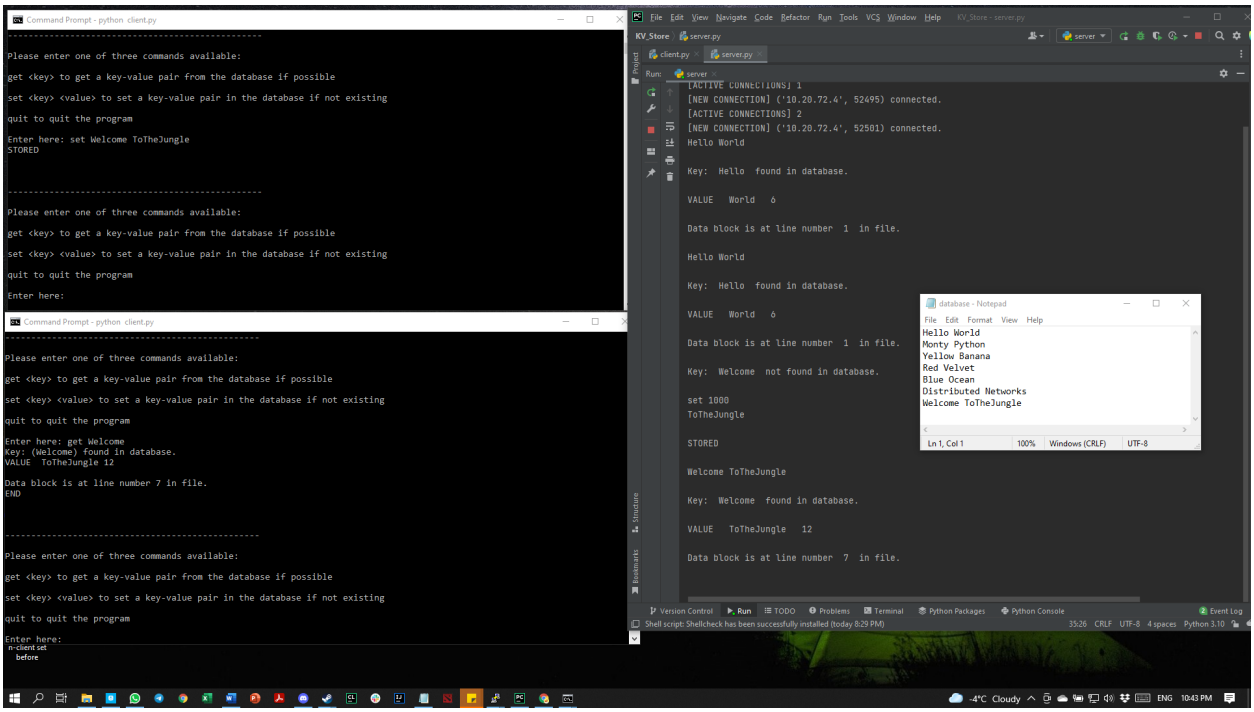

Figure 6: n-client set, after

Looking at both Figures 5 and 6, we can see that the n-client set is working as intended, and the client 2 is able to receive updates in the database from client 1.

Limitations of server and additional details:

Currently, the key and value size limitations are set to 1000 bytes, but it can be adjusted in the client and server.py files.

Expected envisioned concurrency limits are not as high as expected, since there are not many functions and requests running per second.

There are some kinds of errors that I have not managed to handle so far. For example, my string search is not complete, as overlapping words might produce errors. Also, I have not been able to map a one-to-many key-value function.

Overall, I want to improve on the string detection for key get(s) function and to map a one-to-many key-value store.

*** also, my script isn't working right now, I cannot execute the script on linux ***