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**Project Report**

a) Our network application program has four different functions in terms of its operations: send a list of files in a directory, copy, rename, and delete a file. Once the client connects to the server, the server will ask which of the four operations it wants to do. Once the client makes a selection, the server may ask further questions in regard to what the client specifically wants to do. Once the server has all the information it needs to accomplish the task, it executes it and either displays the results to the client or performs the corresponding file management. After accomplishing the task, it asks the client for the next operation. If the client wants to quit then they can exit the program, if not then they can simply continue.

b) We ran into multiple challenges while making the system work, however there were two big ones that we were stuck on for the longest time. One was how to run the client/server system through the mininet VM. We both had the program tested on windows before trying to run it on mininet, but the setup for the VM proved to be more challenging than we thought. We ran into many errors along the way and many times whenever we tried to run it individually, we would get unique errors. Fortunately, through trial and error we brute forced our way to getting the server and client to speak to each other on mininet. The other big problem came right after that. We had written the code that would be able to manage files, but it only worked on windows – not mininet. Therefore, we had to change all the windows specific code to unix code specific code for file management to take place. Both of these problems required multiple hours of google searching and documentation but eventually it worked out in the end.

c) What we learned from the project is how sockets worked and how a server and a client connect to each other. Learning some python syntax also was a plus. I can say that I am more comfortable knowing how hosts are connected to one another using IPs and ports than before. Unix and windows file management techniques were a great plus on the side as well.

d) A recurring algorithm used between the client and server programs is a while loop with if statements strung inside it. The if statements are there to determine which operation the client wants to do – they basically act as mini functions inside the program. The while loop keeps the program running until the user wants to quit. If the client wants to perform an operation then they simply press the number of the corresponding operation and the if statement chooses it for them and performs that function.