Secure Programming – Advanced Project Reflection:

Yuyi Zhang (A1837210) 25%,
Jackson Doley (A1851002) 50%
Xinghan Chen (A1840364) 25%,

Xinghan Chen (a1840364):

My main duty in this group project was to compare and analyse code, with a special emphasis on examining code from other groups. Finding possible vulnerabilities, particularly backdoor vulnerabilities, was the major focus of my effort. I compared the code from other organisations and examined their encryption and security measures as part of our investigation into code vulnerabilities. I learned about various encryption techniques and security precautions for preventing vulnerabilities as a result of this approach.

In our GitHub Repository we have the evidence for this reflection. This consists of the peer reviews and any evidence or extra documents relating to the assignment.

Yuyi Zhang (A1837210) :

My responsibility in this group project was to supplement and review the content of the code and the content of the report. At the same time, I am great at identifying internal vulnerabilities while analyzing the code. In fact, the code I reviewed was quite complex, especially the content written by the group led by Mr. Brandt. After reviewing their code, I became keenly aware of my own shortcomings and gained a lot from their use of various encryption technologies and server architectures. Additionally, I compared the code from other groups and thoroughly examined their encryption/decryption methods and security measures, which also benefited me greatly, and I learned a lot about vulnerabilities and encryption.

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Jackson Doley (A1851002)

I began this project by joining the discord server after I saw a post in Piazza back in week 2 of this semester. From there I was able to quickly find a group and begin working with that group on how to tackle this project. It was very beneficial being in the discord server as at that time there were a few protocols being discussed so it was interesting to see the conversations people were having while discussing what protocol the project should use. My initial group seemed to be working quite well together in the early stages. However, during the mid-semester break I was told that the group had disbanded. This was unknown to me but had apparently occurred several weeks before hand which left me in a tricky situation as I had no group, and the submission of the initial implementation was arriving quickly. Luckily, I was able to find another person without a group and form a group with them. A couple days after, we added another member to finalize our 3-man group.

We only had a few days left before the submission was due so we tried our best to put something together so that the other groups would be able to provide us with some feedback that we could take into the final submission. We used the OLAF/Neighbourhood protocol which was a protocol developed by students in the discord server. It was very encouraging to see these people working together to create something such as this and I was thoroughly impressed and thankful for their efforts. After knowing what protocol, we were using we began working on the Implementation. Personally, I worked on the entire coding aspect of the project. This was particularly challenging for myself as I am not very experienced or highly skilled with coding in general. However, I took on the challenge and learnt a lot from the experience. Another one of my group members, Yuyi Zhang, had been working on the assignment by himself however he believed we needed to make our own chat system by focusing both on the front end and the back end of the system. We could have used front-end in our implementation however from my understanding I believed we only needed the back-end to follow the protocol so we could connect the chat system with the other groups. Therefore, a lot of his work ended up not being needed.

After we submitted the initial implementation, we then shifted our focus onto reviewing the code from the other groups that each of us were assigned to. We did this task individually and didn't work together to review other group's code. This was probably a missed opportunity as it is important to learn how to work together when reviewing code and taking perspectives and ideas from others. This also could have potentially increased the likelihood of finding potential issues with the code as there would've been multiple people reviewing it. Personally, with the peer reviews I found them to be challenging but they also provided a beneficial experience as I was able to learn a lot about reviewing code and finding potential flaws in code. I learned how to use a particularly good tool for python called Bandit as I saw someone had recommended it in the discord. This was very useful in my reviews as it was able to pick up on things that I otherwise may have overlooked. I found it to be a challenge manually reviewing other's code, but it was a valuable experience as I was able to learn new skills. Furthermore, comparing other people's code to our own provided a unique insight into new ways of doing things that I may not have considered. Overall, it was a very valuable experience in a multitude of ways, and I am personally very glad that that was a part of the assignment.

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After the peer reviews were finished, we shifted our focus back onto our own implementation. We were able to take the feedback we got from other groups and use it to improve our implementation. In our initial implementation we only had a client.py and server.py files as well as a basic README. Our backdoors weren't very complex and basically every group that reviewed our code was able to find them. This was largely due to the unfortunate circumstances we found ourselves in as we had little time to write whatever we could to submit so that we could get any feedback at all. If I could do this again, I would've tried to make the backdoors much more discrete and well-hidden so that it was more of a challenge for the other groups to identify them. We expanded upon this for the final implementation by improving the server.py and client.py files as well as adding a .gitignore file, dockerfile, config.json file, file_transfer.py file, http_client.py file, http_server.py file, logging.conf file, and a txt file with the requirements. Furthermore, we created a couple of test files. These finalized our work for the implementation. As I was the only one working on the code it made it difficult to test and make sure everything was working so unfortunately, I am not 100% sure it comes completely bug free. However, considering the circumstances I am proud of myself for being able to come up with something for the implementation. I certainly surprised myself and learned a lot from this experience.

Overall, I believe that Yuyi Zhang contributed to the group but unfortunately, I believe that he didn't have a proper understanding of what we needed to do for the project initially, so a lot of his work ended up not being needed. Therefore, I feel it is harsh to give him a low percentage for the contribution but if we are to go by the truth and actual used work, he contributed maybe 2.5% of the total workload.

As for Xinghan Chen, he joined the group very late, just before the submission for the initial implementation, however he offered to help in whatever way he could right from the start. He contributed by writing 99% of the README file as well as comparing our code to other group's code so we could see where we could improve. This was a great help to the group. If he had contributed more to the code and the actual files for the implementation, then I would have given him a higher percentage. As valuable as the 2 things he did contribute are, they overall do not count for a massive amount of the work so I would say he contributed to about 10% of the work.

As for myself, I don't want to seem selfish, however the large majority of the implementation was done by myself. I completed all of the code and all of the files of the implementation. I also tried my best to organise our group and let the others know if I found something that we should all be aware of that may make their lives easier and help them understand what they needed to do. I also used the feedback provided to us from other groups and implemented it into our implementation so that we could improve on what was already there. Because of this I believe that I contributed to at least 87.5% of the total work.

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