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# 1 Introduction

In this report, we document the progress made during Milestone 1 of our project, which involves demonstrating the ability to send and receive UDP packets in accordance with a specified protocol. We will also show that we can receive data reliably, even in the presence of packet loss. Additionally, we will verify the MD5 hash from the server and create relevant graphs to visualize our results.

# 2 UDP Packet Communication

To begin this milestone, we successfully implemented UDP packet communication in accordance with the specified protocol. This involved setting up a UDP socket for both sending and receiving data. The protocol details were followed, ensuring proper message formatting and data transmission.

# 3 Reliable Data Reception

Our next task was to establish reliable data reception. Given that the server emulates packet loss and network instability, we sent requests slowly to minimize potential data loss. Despite our efforts, some requests still did not receive a reply. To address this issue, we implemented a retransmission mechanism for missing data. We continued to assemble received data and sent additional requests for any missing data. This ensured that we collected as much data as possible from the server.

# 4 MD5 Hash Verification

One critical aspect of our milestone was verifying the MD5 hash provided by the server. After receiving the data, we sent the submission message to the server, to verify if our submission is valid which returns the result if the submission is valid, total time taken, and the penalty awarded during the execution of fetching the data from the server.

# 5 Graphical Analysis

As part of our report, we created graphical representations to illustrate our progress and results. These graphs include:

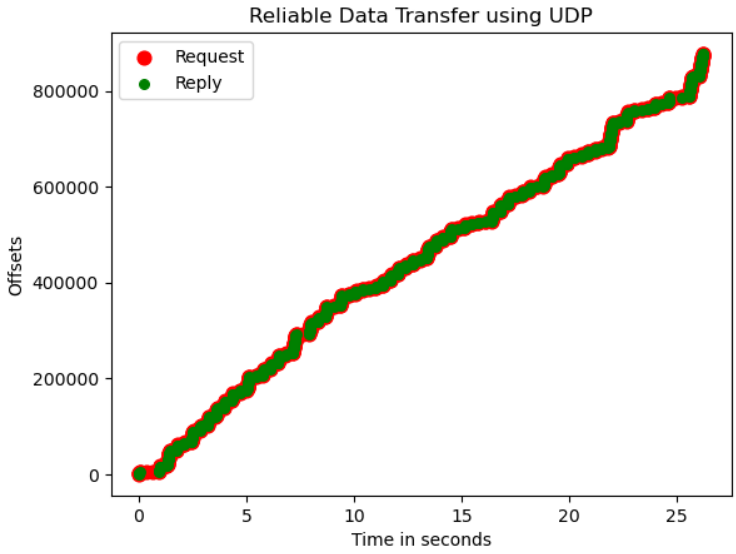


Fig.1. Request-Reply for offsets vs Time in seconds

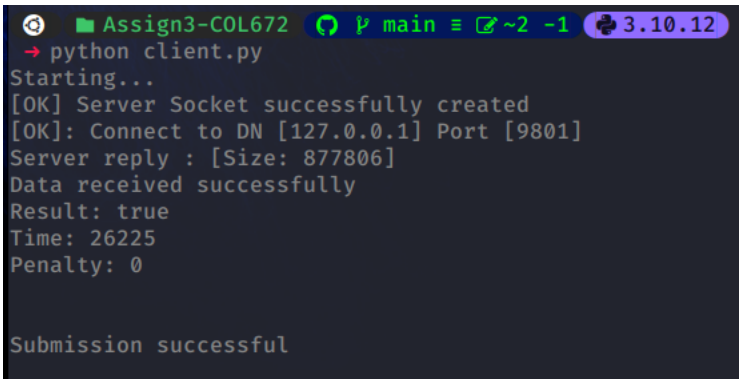


Fig.2. Server reply that the md5 hash is correct and submission is valid, also with 0 penalty

## 6 Conclusion

In conclusion, Milestone 1 of the assignment was successfully completed. We have demonstrated our ability to send and receive UDP packets according to the specified protocol. We implemented a reliable data reception mechanism to mitigate packet loss and verified the data's integrity using MD5 hashing. The graphical representations help visualize our progress.