

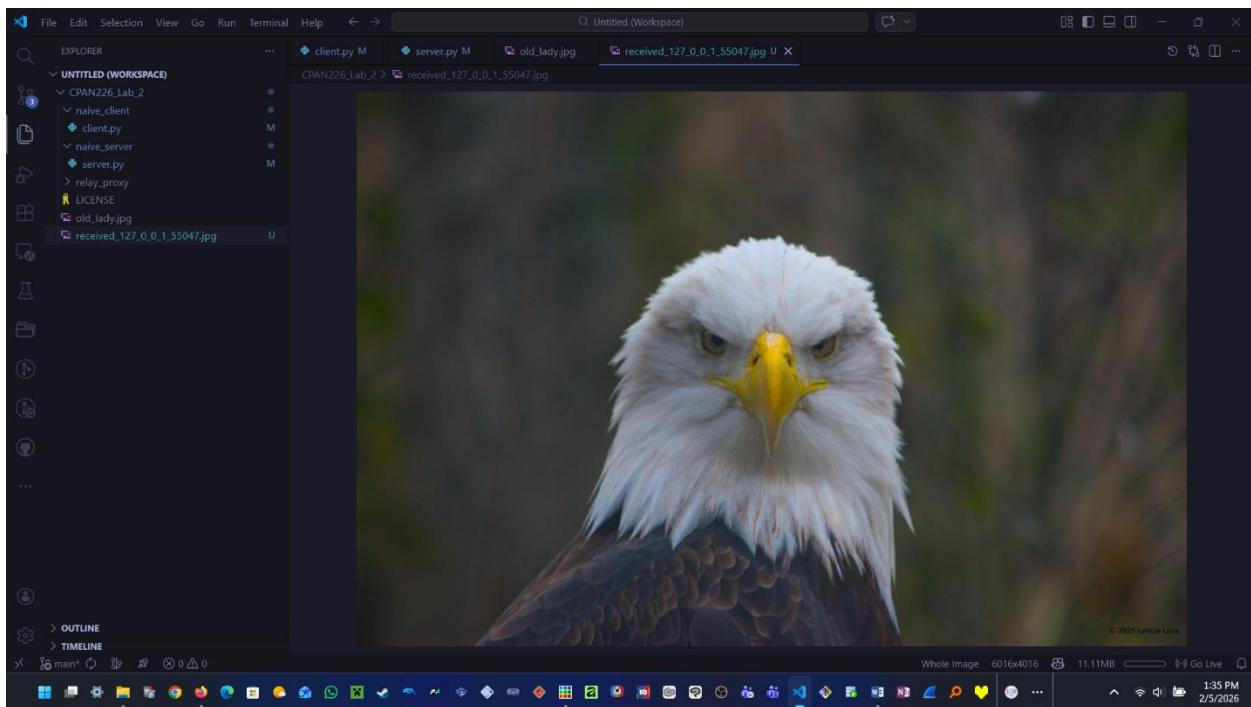
# CPAN226 Lab 2 Report

Kerlan Augustine, N01375372

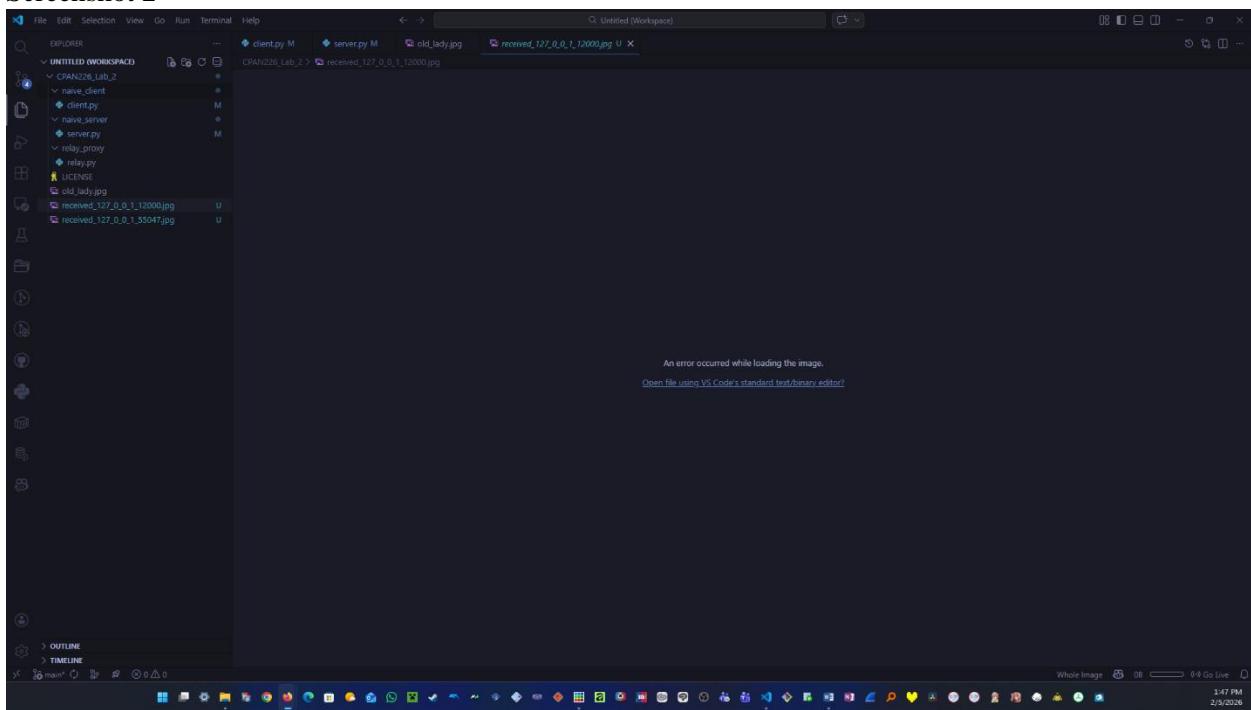
To handle the chaos of an unreliable network, the server uses a dictionary-based buffering system designed to ensure data is written to the file in the correct chronological order, regardless of when it actually arrives. When a packet is received, the server checks its sequence number against the **expected\_seq\_num**. If they match, the data is written immediately, and the server then checks the buffer to see if the next required packets, which may have arrived early and been stored, are now ready to be released and written in sequence. If a packet arrives with a higher number than expected, it is held in the buffer instead of being written, which prevents the image file from becoming corrupted. This logic effectively reassembles the image, ensuring that even if the relay reorders or drops packets, the final file remains a complete match of the original.

## Screenshots:

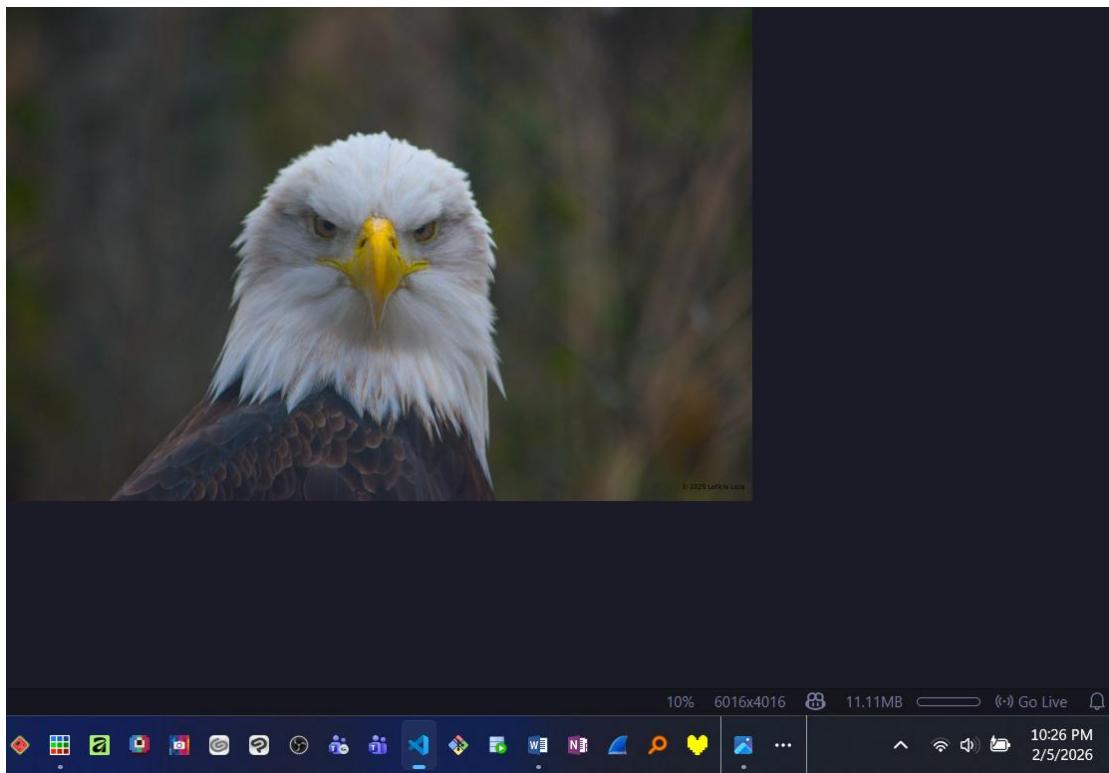
Screenshot 1



Screenshot 2



Screenshot 3



## Screenshot 4

The screenshot shows a Microsoft Visual Studio Code (VS Code) interface running on a Windows operating system. The workspace is titled "CPAN226\_Lab\_2". The Explorer sidebar shows files such as client.py, server.py, relay.py, LICENSE, old\_lady.jpg, received\_127.0.0.1\_12000.jpg, received\_127.0.0.1\_55047.jpg, and received\_final.jpg. The terminal tab displays a log of proxy operations, including multiple instances of "Wrote" and "Retransmitting packet" messages, along with several "Error: [WinError 10054] An existing connection was forcibly closed by the remote host" errors. The preview tab shows a close-up photograph of a bald eagle's head. The taskbar at the bottom of the screen contains icons for various Windows applications.

```
[+] Wrote 2832 [*] Retransmitting packet 2837...
[+] Wrote 2833 [*] Retransmitting packet 2838...
[+] Wrote 2834 [*] Retransmitting packet 2838...
[+] Wrote 2835 [*] Retransmitting packet 2838...
[+] Wrote 2836 [*] Retransmitting packet 2838...
[+] Wrote 2837 [*] Retransmitting packet 2838...
[+] Wrote 2838 [*] Retransmitting packet 2838...
[+] Wrote 2839 [*] Retransmitting packet 2840...
[+] Wrote 2840 [*] Retransmitting packet 2840...
[+] Wrote 2841 [*] Retransmitting packet 2840...
[+] Wrote 2842 [*] Retransmitting packet 2840...
[+] Wrote 2843 [*] Retransmitting packet 2842...
[+] Wrote 2844 [*] Retransmitting packet 2842...
[+] Wrote 2845 [*] Retransmitting packet 2846...
[+] Wrote 2846 [*] Retransmitting packet 2846...
[*] SUCCESS: received final.jpg is ready. [*] Sending EOF...
[*] Retransmitting packet 2842...
[*] Retransmitting packet 2842...
[*] Retransmitting packet 2846...
[*] Retransmitting packet 2846...
[*] Retransmitting packet 2846...
[*] Retransmitting packet 2846...
```