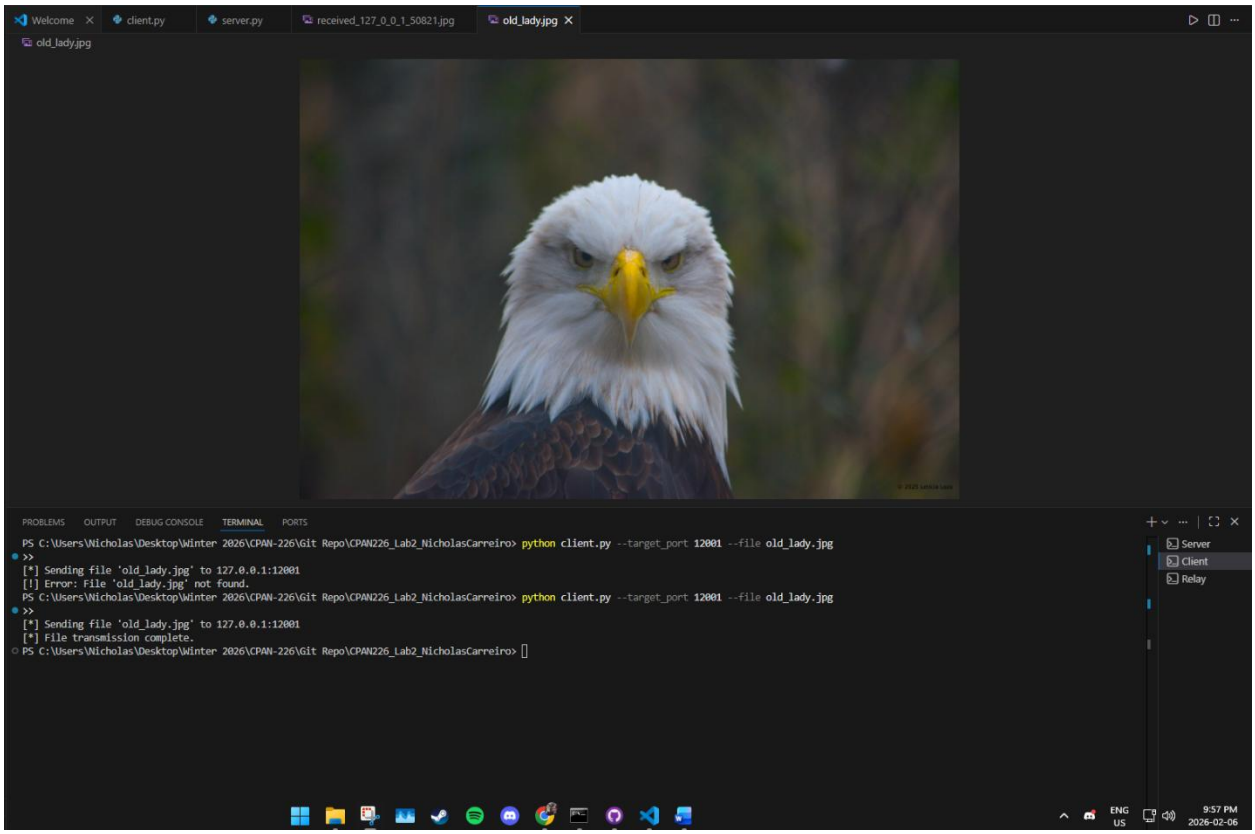
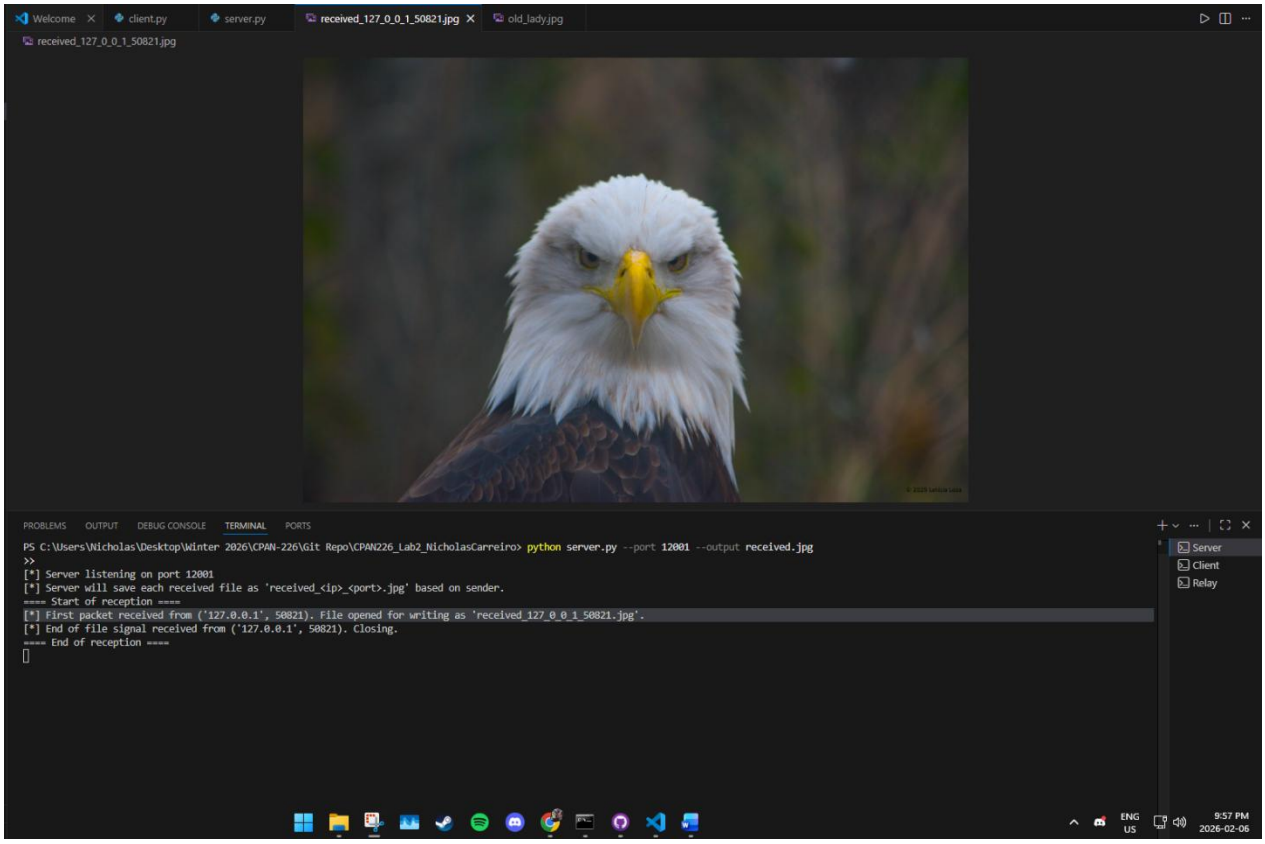
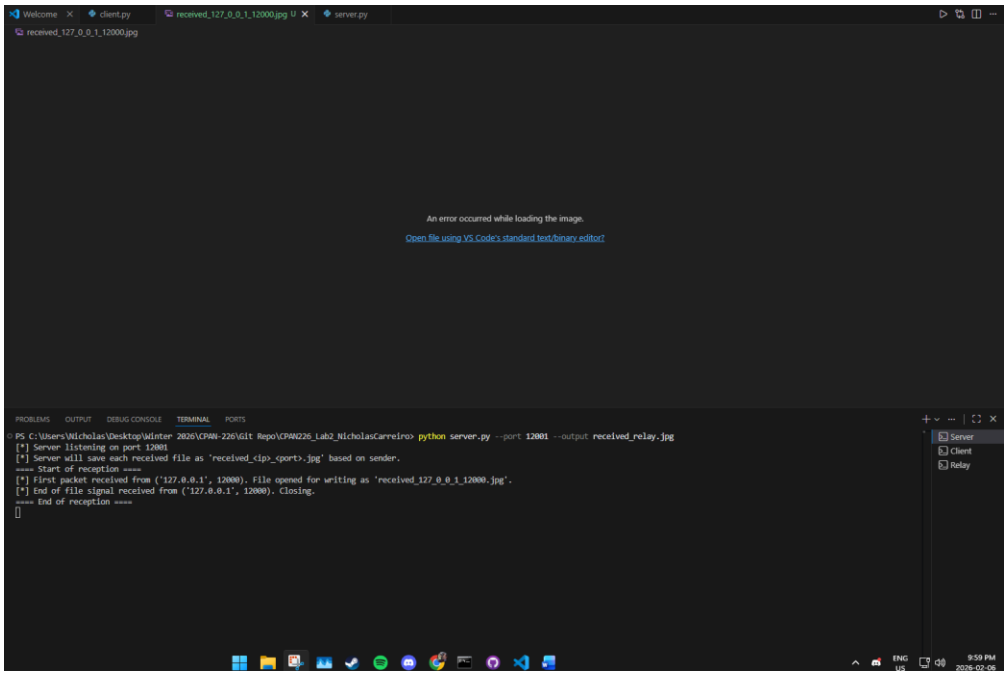
CPAN 226 - Lab 2: Reliable Transport over UDP

1. **Lab Report (PDF or Readme)**
    - **Screenshot 1:** The two jpg files (old_lady.jpg and the received version) from the direct client to server transfer (without the relay).

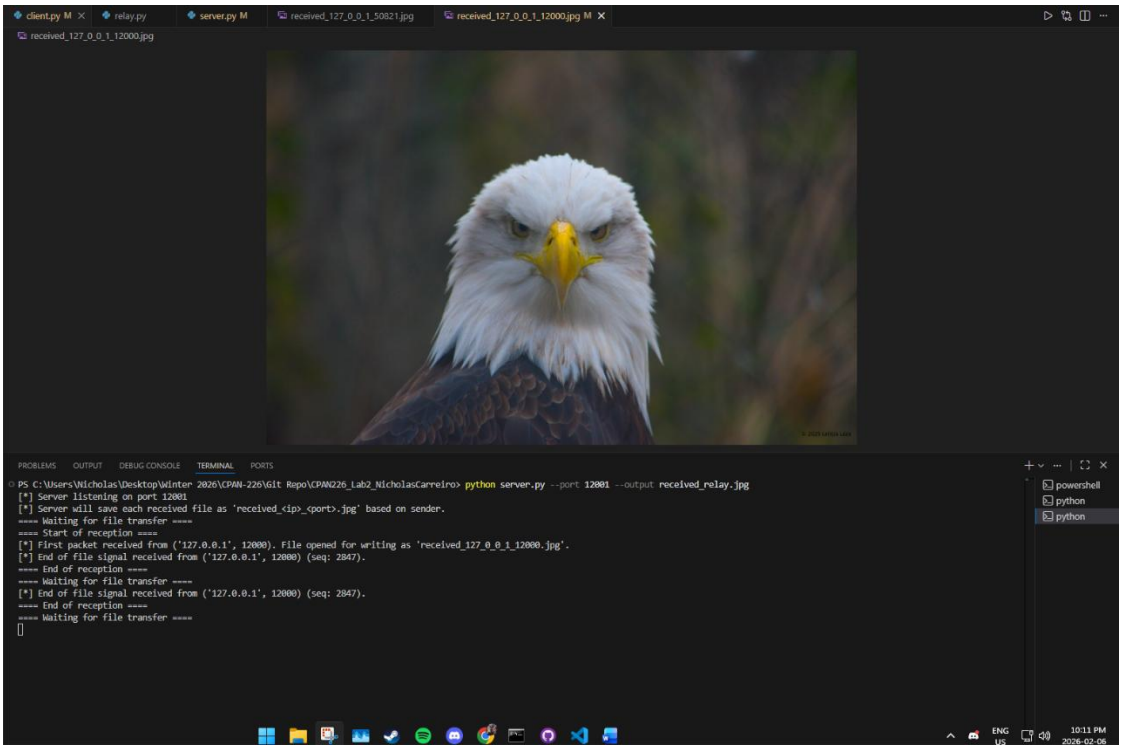




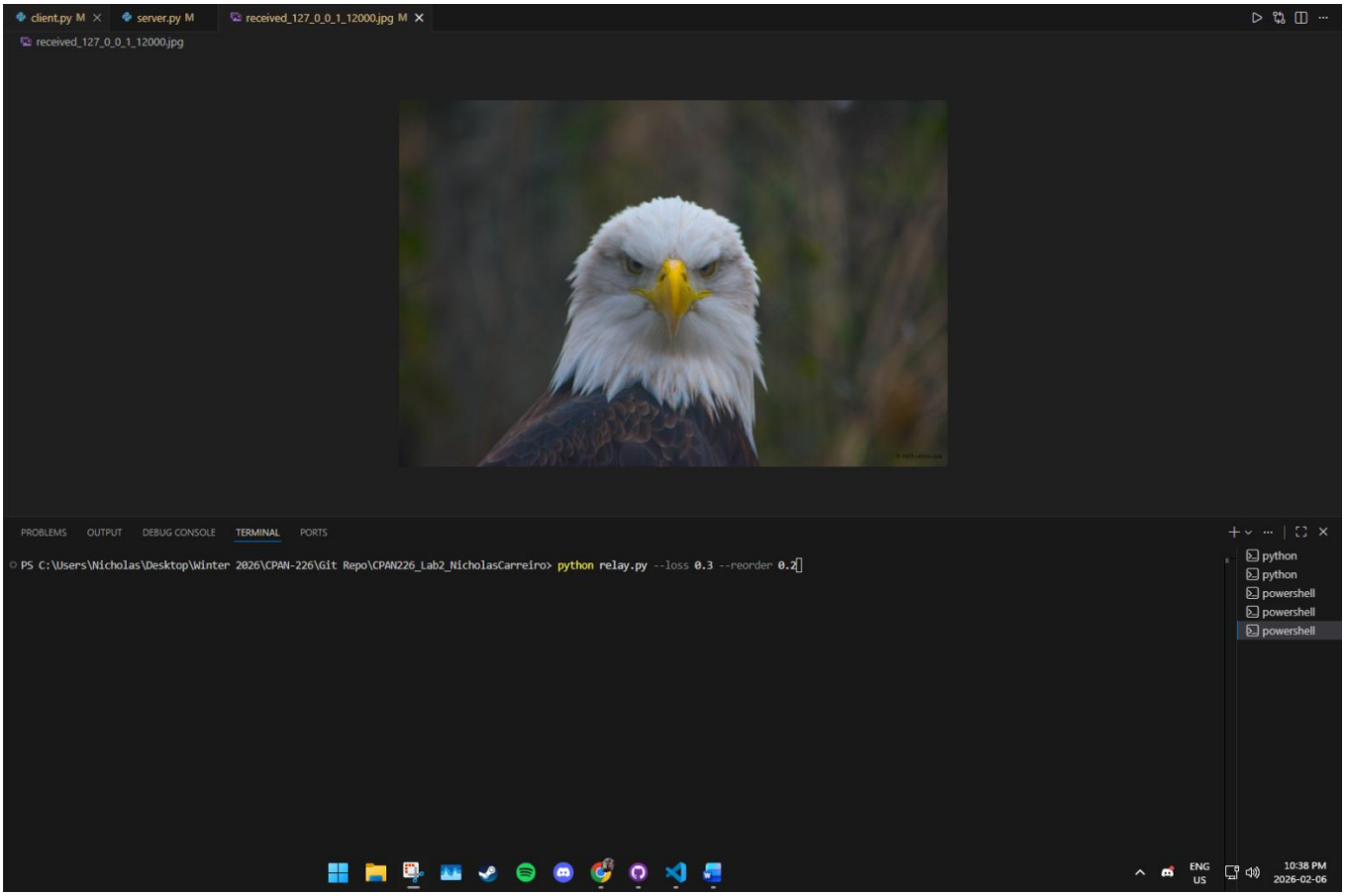
- **Screenshot 2:** The corrupted received_relay.jpg (from Test B).



- **Screenshot 3:** The clean received.jpg after your code fix, successfully transferred through the relay.



- **Screenshot 4:** The result of the Final check.



- A brief explanation (1 paragraph) of how your Buffer logic works.

  The server maintains an expected_seq_num counter starting at 0 and a dictionary buffer to store out-of-order packets. When a packet arrives, the server extracts its sequence number and checks three cases. If the sequence number matches the expected value, the data is written immediately to disk and expected_seq_num is incremented, the server then checks if subsequent packets are already waiting in the buffer and writes them in order. If a packet arrives with a sequence number greater than expected (out-of-order), it is stored in the buffer dictionary keyed by its sequence number for later processing. If a packet arrives with a sequence number less than expected, it is discarded as a duplicate. This ensures that regardless of the order packets arrive from the network, they are always written to the file in their correct sequential order, preventing corruption.