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Code 1: server.py

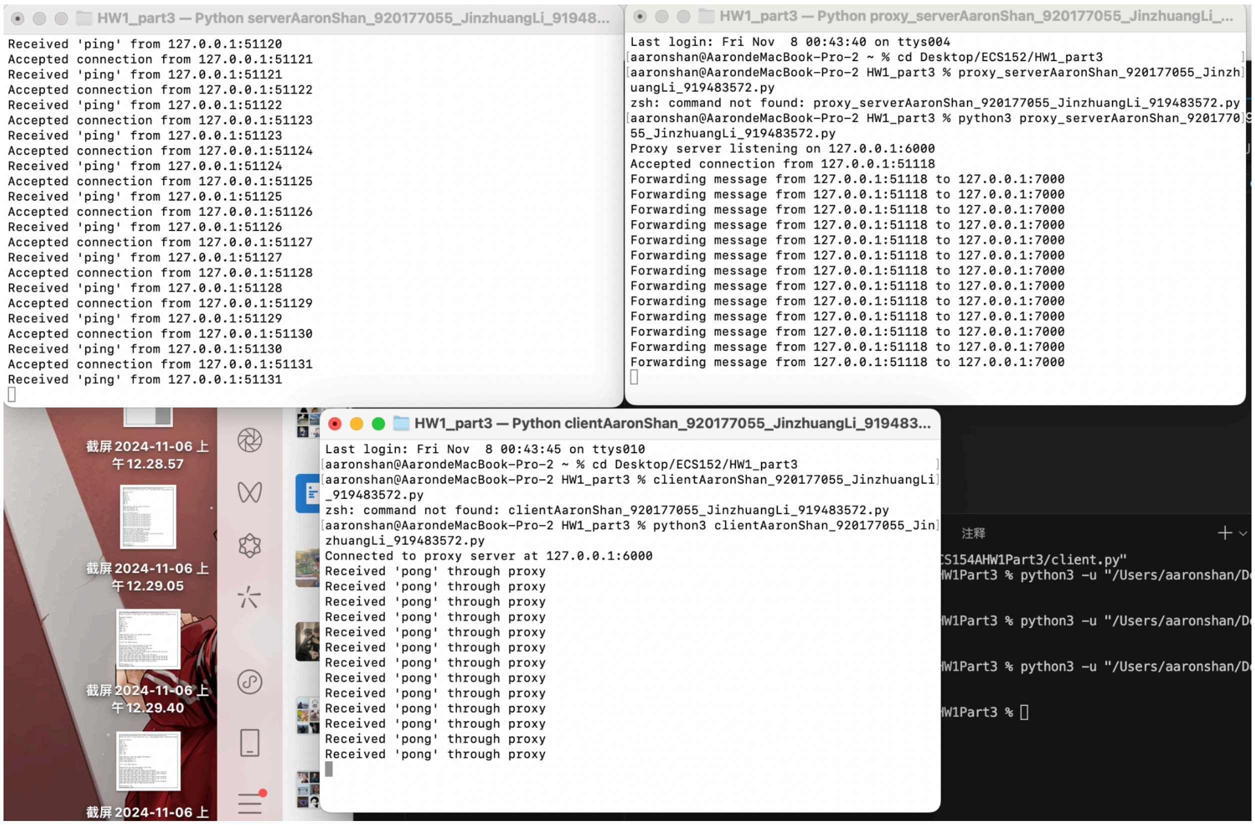
Code 2: proxy.py

Code 3: client.py

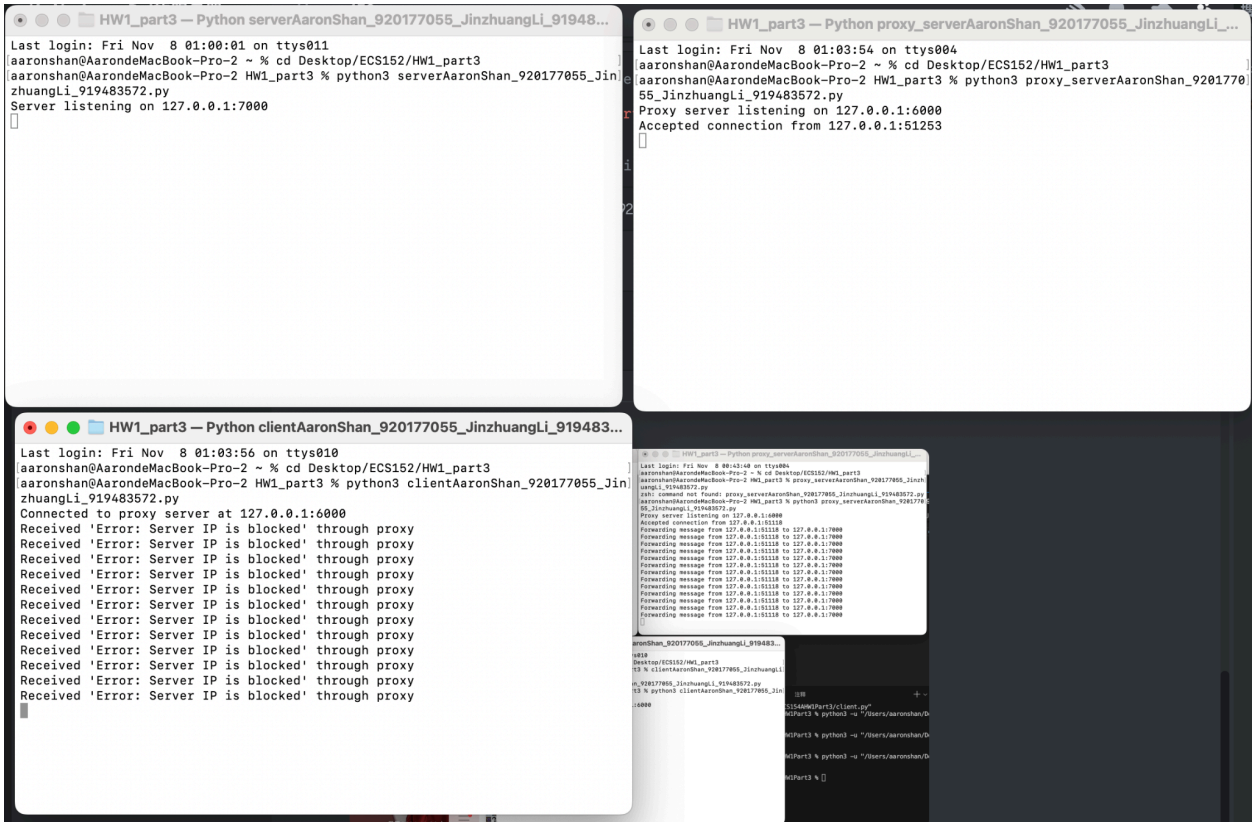
1. Challenge Description: The main task was to create a three-component system: a client, a proxy server, and a destination server. The key challenges included:
    - Implementing communication between three separate components
    - Handling JSON formatting for client-to-proxy communication
    - Managing IP blocking functionality in the proxy
    - Maintaining the original ping-pong functionality
2. File used from the discussion section: **tcp-client-v2.py, tcp-server-v4.py**
3. Server Component:
    - Used the provided tcp-server-v4.py as base
    - Modified to handle ping messages and respond with pong
    - Implemented ThreadPoolExecutor for handling multiple connections
    - Set up on port 7000 as specified
4. Proxy Component:
    - Created proxy server listening on port 6000
    - Implemented JSON message parsing
    - Handled forwarding messages between client and server
    - Managed error cases and response routing
5. Client Component:
    - Modified from tcp-client-v2.py
    - Added JSON message formatting
    - Redirected connection to proxy instead of server
    - Maintained one-second intervals between pings
6. Error Handling:
    - Invalid JSON format from the client
    - Network connection failures
    - Blocked IP attempts
    - Server unavailability
7. Testing Strategy:
    - Tested normal operation (successful ping-pong)
    - Tested blocked IP scenarios
    - Tested connection failures
    - Tested invalid JSON formatting

8. For the ip block list in the proxy server file:
    - I added 10.0.01 and 192.168.1.1, and we can add more if we want to
    - For the local ip address 127.0.0.1, If we want to test, then we just release it from comments

9. Output → Successful Ping-Pong:



10. Output → IP Blocked


HW1_part3 — Python serverAaronShan_920177055_JinzhuangLi_91948...
Last login: Fri Nov 8 01:00:01 on ttys011
aaronshan@AarondeMacBook-Pro-2 ~ % cd Desktop/ECS152/HW1_part3
aaronshan@AarondeMacBook-Pro-2 HW1_part3 % python3 serverAaronShan_920177055_JinzhuangLi_919483572.py
Server listening on 127.0.0.1:7000
HW1_part3 — Python proxy_serverAaronShan_920177055_JinzhuangLi_...
Last login: Fri Nov 8 01:03:54 on ttys004
aaronshan@AarondeMacBook-Pro-2 ~ % cd Desktop/ECS152/HW1_part3
aaronshan@AarondeMacBook-Pro-2 HW1_part3 % python3 proxy_serverAaronShan_920177055_JinzhuangLi_919483572.py
Proxy server listening on 127.0.0.1:6000
Accepted connection from 127.0.0.1:51253
HW1_part3 — Python clientAaronShan_920177055_JinzhuangLi_919483...
Last login: Fri Nov 8 01:03:56 on ttys010
aaronshan@AarondeMacBook-Pro-2 ~ % cd Desktop/ECS152/HW1_part3
aaronshan@AarondeMacBook-Pro-2 HW1_part3 % python3 clientAaronShan_920177055_JinzhuangLi_919483572.py
Connected to proxy server at 127.0.0.1:6000
Received 'Error: Server IP is blocked' through proxy
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