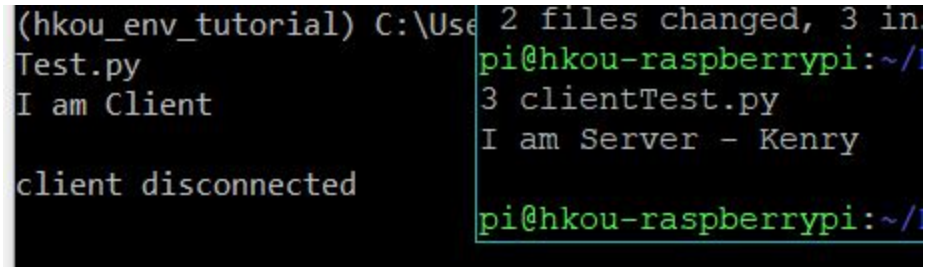
Henry Kou: 204921239, Team 6, EE180DA **Week 2 Lab Report**

1. **Action Items (plan)**
    a. Purchase parts - **complete (Rpi received, IMU in received)**
    b. Project proposal draft - **completed**
        i. Researched ideas from previous projects including GTUber.
        ii. Organized requirements and brainstormed ideas in doc: https://docs.google.com/document/d/14qEbNp-ccn-4xFTJozqWrSGkgyK1If69mKqUCWvCHLw/edit?usp=sharing
        iii. Proposal: https://docs.google.com/document/d/1FD5lTA9HpBlVuIAL4ze1VVAhlEaiysQiKKZVQ3L2_zc/edit?usp=sharing
        iv. Team 6 presented Workout Warrior proposal on 10/16/20.
        v. The following feedback notes were given:
            1. Data on pose matching (improper/proper) is challenging
                a. Proper should be more achievable
            2. Three other groups have health related
                a. Other group is more niche
            3. Uniqueness?
                a. Differentiate at feature level
            4. Collect a lot of data
                a. Diff body types
                b. Calibration IMU
            5.
            6. Ring fit adventure as inspiration
                a. Specific subset of workouts
            7. Able to game-ify more
            8. Be more specific
            9. Possible: actions to effects
            10. Seems too broad,
            11. More interaction
            12. Presentation format is satisfactory
    c. Tutorial 1 Intro to Comms
        i. Task 1: Implement Sample TCP/IP on RPi - **completed**

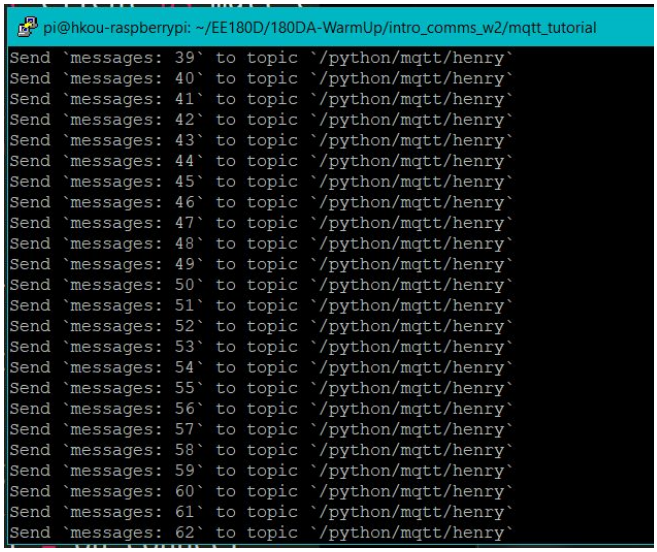
Setup TCP/IP connection between laptop and Rpi using python's socket library. Created two files, serverTest.py and clientTest.py, where the server is the laptop and client is the RPi. Had to perform extra modifications on the code with IP address, port number, and data type compatibility.

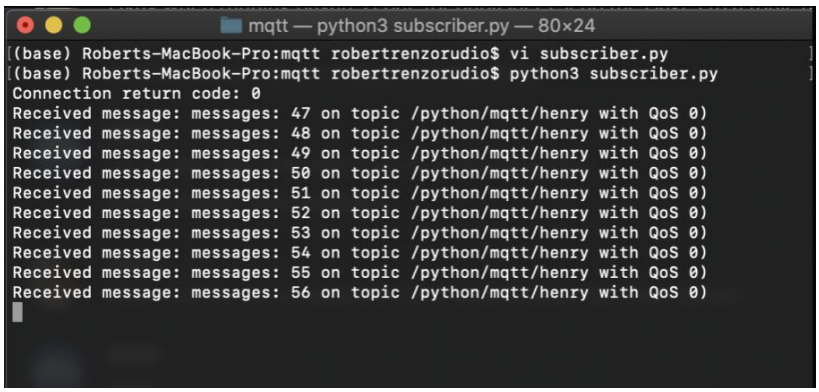
Results:



        ii. Task 2: MQTT Protocol Between multiple RPis - **completed**

Setup publisher and subscriber on RPi using MQTT protocol based off of TCP/IP. Allows for space and time decoupling where publisher and subscriber don't need to know each other and publisher and subscriber don't need to be running at the same time. I installed Paho for MQTT on my RPi. For demonstration, I ran publisher code on my RPi, and communicated with my teammate's RPi at his home by running his subscriber code. The topic was consistent across both.





Above are the results of the MQTT protocol implementation across multiple RPis.

2. **TODO Items:**
    a. Continue flushing out details for the final project proposal on Workout Warrior with team 6.
    b. Brainstorm further ideas on Workout Warrior OR another embedded project using OpenCV.
    c. Final midterm presentation for design project.
3. **Errors Encountered**
    a. When performing TCP/IP between server and client on my laptop and RPi, I encountered some type errors that didn't accept messages coming from my laptop to the RPi.
    b. In addition, finding the right IP address for the server and client was troublesome as my initial understanding believed 0.0.0.0 would work, but my assumption was incorrect. After further collaboration and trials, the correct IP address was input and the TCP/IP communication between laptop and RPi was successful.