1 Program Structure

To execute my program, type “python3 Agent.py”, “python3 Receiver.py”, and ”python3 Sender.py” in order.

1.1 Environment

- OS: Arch Linux (4.19.1)
- Programming language: Python (3.7.1)
- Standard Python3 packages: socket, random

1.1.1 Configuration

Default arguments are listed in “parse_args” function in the file “utils.py.”

1.2 Program Flow

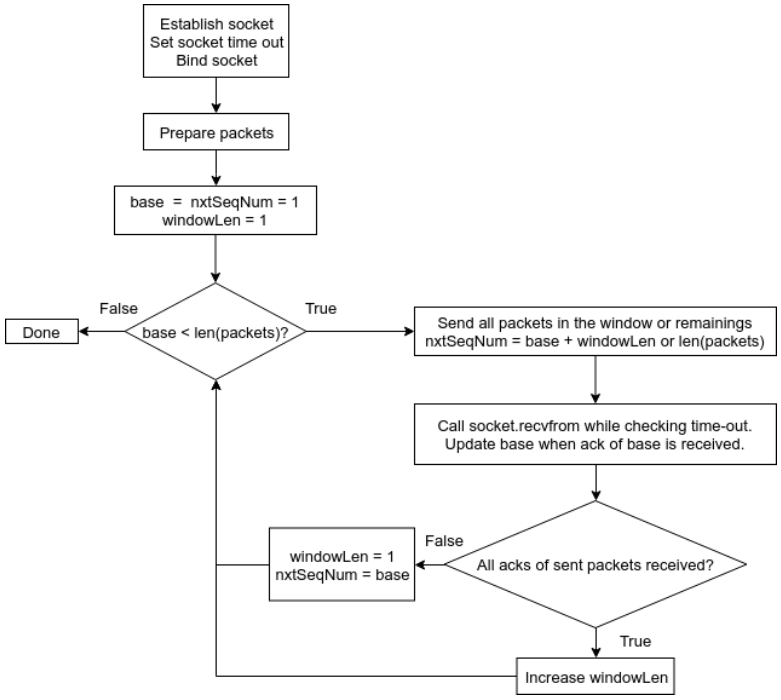

Figure 1: Flow of Sender.

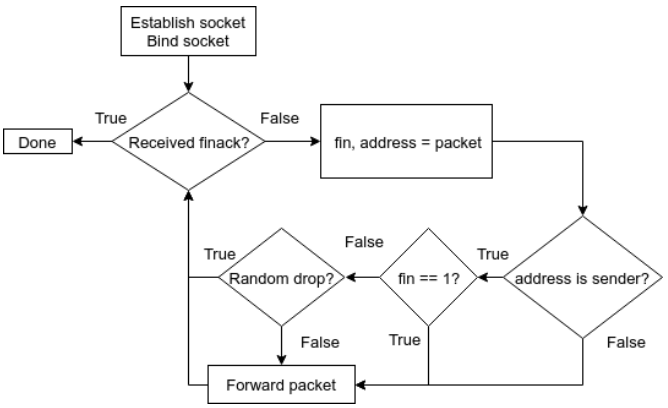

Figure 2: Flow of Agent.

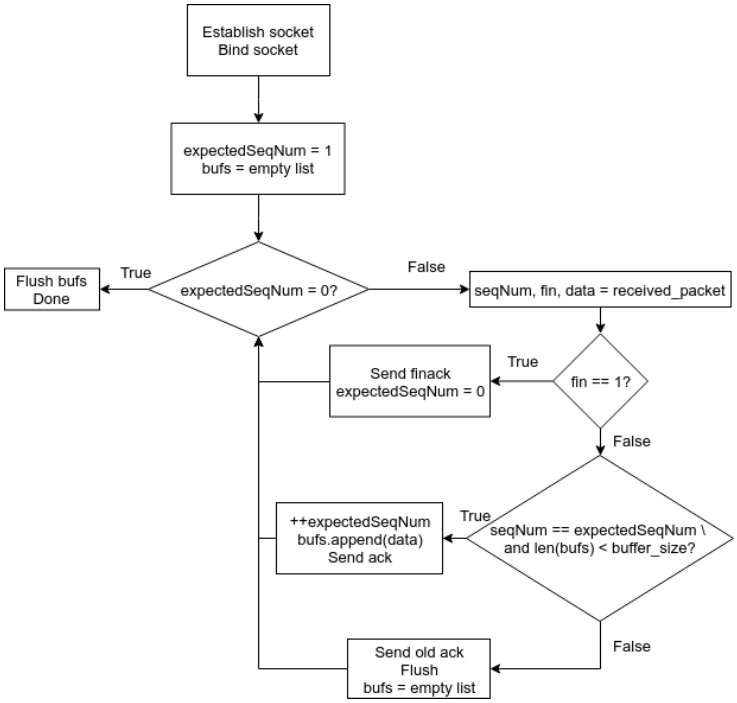

Figure 3: Flow of Receiver.

2 Difficulties and Solutions

2.1 Communication between Python and C (i.e. TA's agent.c)

Integer in Python is not fix-sized. Saving a Python integer naively, such as using pickle, will result in variable-sized data. However, 32-bit integer is needed in the `header` struct in "agent.c." After searching for a solution, I came across `to_bytes` and `from_bytes` functions that are meant to encode Python integer into fix-sized data. Finally, after some trials and errors, I found that specifying `4`, `little-Endian` and `signed=True` in the functions' arguments solves the issue.

2.2 Loss rate and buffer size

After finishing "Sender.py" and "Receiver.py", I realize that my `winSize` never reaches 3. At first, I thought there may be some bugs. However, after reviewing my code, I cannot found any major bug. Eventually, I found that the default value of loss rate is too high, and the default value of buffer size is too low. After setting new default values, the problem is solved.