

# Computer Network Homework 2 Report

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## 1 About the Program

### 1.1 Environment

- **Machine:** CSIE Workstation
- **GCC:** gcc 6.2.1 20160830

### 1.2 Libraries

I do this socket programming on Linux system and follow the newer official standard, which is POSIX Sockets API.

## 2 How to Execute

Simply type command “**make**”, and then all the executable programs will be compiled.

There are totally 4 programs,

- **sender**
- **receiver**
- **agent**
- **sender-mt**

And you can simply type commands like “**./sender**”, and it will remind you the correct way to run the program.

## 3 My Design

### 3.1 Program Structure

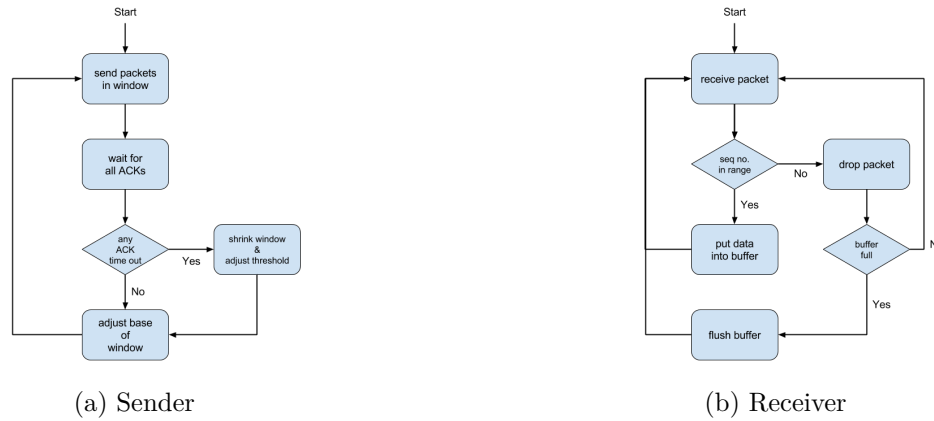


Figure 1: Simple Program Structure

### 3.2 Difficulties and Solutions

The difficulties I met in the homework assignment is how to design the program structure and how to combine the three programs: **sender**, **receiver**, and **agent**. It's really hard at the beginning that I had no idea where and how I can start. Latter, I tried to start these programs and make them communicate to each others through POSIX sockets. And I followed these steps to complete this assignment:

1. Send packets from sender to agent, and forward them to receiver
2. Send back ACK for each packet (Receiver)
3. Send next packet only when receive ACK (Sender)
4. Resend timeout packets (Sender)
5. Randomly drop data packets (Agent)
6. Add congestion control (Sender)
7. Add buffer handling (Receiver)

### 3.3 Bonus

I implemented a multi-agent sender. That is, there are many agents, and sender randomly pick one agent to send at each time it sends a packet.