IERG3310 Lab1 Report

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I. The environment for compiling my codes

```
PS C:\Users\苏采奕> gcc --version
gcc.exe (MinGW.org GCC Build-2) 9.2.0
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This is free software; see the source for copying conditions.  There is NO
warranty; not even for MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE.
```
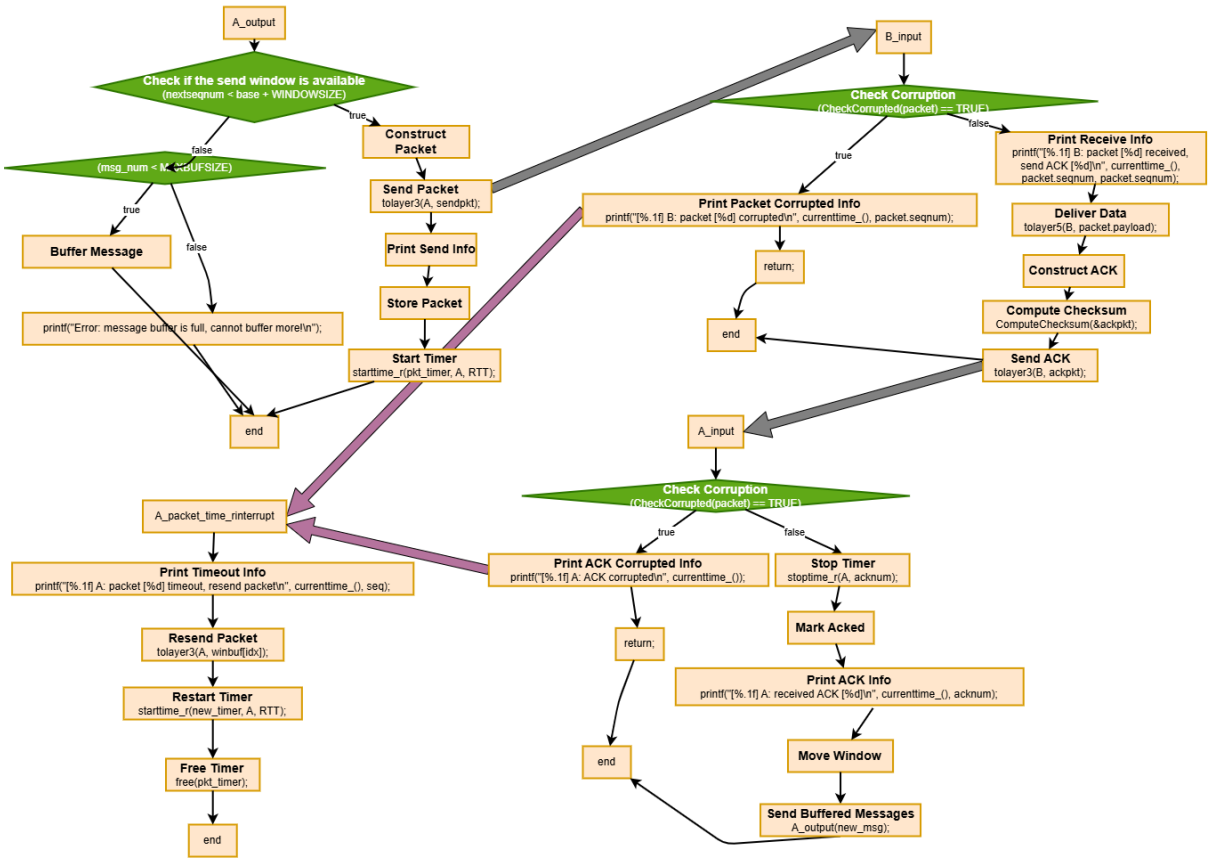
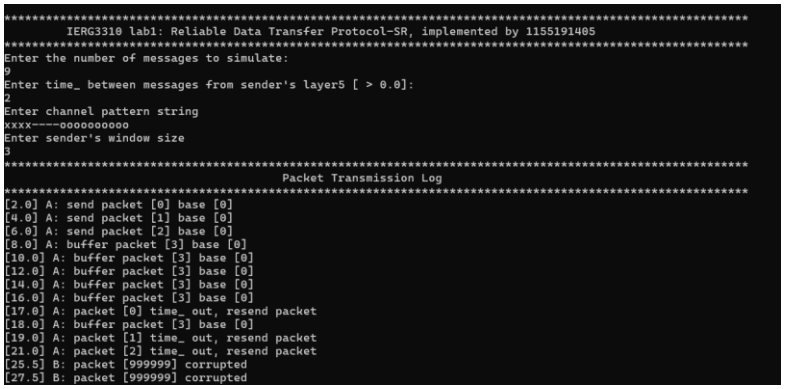
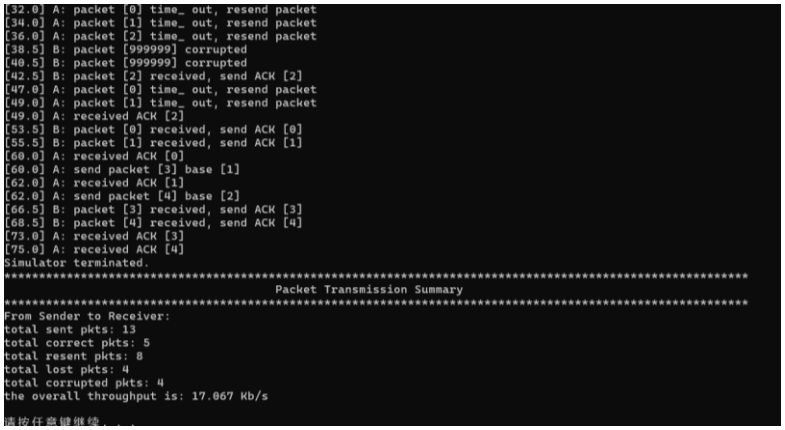

II. Flow chart of *A_output*, *A_input*, *B_input* and *A_packet_time_rinterrupt*



III. Problems met in the implementation and corresponding solutions

Problem: After my code can successfully test the two examples given, I tried to test other Enter channel pattern strings. I found that if I set the Enter channel pattern string input to put x and - at the beginning of the information transmission, such as "xxxx----ooooooooo", my output will show that my packet cannot be sent out completely (as shown in the figure below)





Solution: After I carefully checked the code and the principle of SR, I found that it was because the A side only base++ when acknum == base (the window only moves one packet at a time), but did not continue to check whether the subsequent sequence number was also ACKed, or did not update the status of the corresponding window cache in the "out-of-order" scenario.

The correct approach should be:

- When A_output() sends a new packet, put it into the send window array winbuf[i] and write the status:
  - Sent + Waiting for ACK.
- When A_input() receives a certain ACK=acknum:
  - Find the item with seq=acknum in the send window and mark it as "ACKed".
  - If acknum == base, move base forward, but not just base++, but continuously check: Is the next sequence number marked as ACKed? If so, continue ++ until you encounter a seq that has not been ACKed.
  - When the window moves forward, if there are still cached messages (in buffer[]) and there is space in the current window, continue to send new packets.

After my modification, the input of "xxxx----ooooooooooooo" can be transmitted completely, but when I re-enter the two examples given, I find that the base of the packet at the 32nd second in the output of the second example is different from my output. I checked SR's interactive animation and it was the same as my output. I immediately asked TAs and the professor and got a positive answer.