

# Computer Network Assignment3

2016302580127 曹相成

Q1:

Client.py:

```
Server x Client x
/Users/xiangchengcao/Documents/大三下/计算机网络/Assignment3/venv/bin/python /Users/xiangchengcao/Documents/大三下/计算机网络/Assignment3/Client.py
Please input data sending to server:Hello,Jacky Xiangcheng
bye
Please input data sending to server:bye

Process finished with exit code 0
```

Server.py:

```
Server x Client x
/Users/xiangchengcao/Documents/大三下/计算机网络/Assignment3/venv/bin/python /Users/xiangchengcao/Documents/大三下/计算机网络/Assignment3/Server.py
('127.0.0.1', 64086)
Hello,Jacky Xiangcheng
Please input data sending to client:bye

Process finished with exit code 0
```

The detailed codes are added in the files.

Q2:

1.P3:

$01010011+01100110+01110100=00101110$  and its complement is 11010001.

The receiver checks the sum of words and checksum. The sum should be all 1s. If it contains a 0, something must be wrong during the process. So the 1-bit errors can be detected and 2-bit errors cannot be detected.

2.P12:

The protocol will still work. A retransmission would happen if the packet received with errors has actually been lost. If there exists 1-bit error and if each extra copy of the packet is ACKed and each received extra ACK causes another extra copy of the current packet to be sent, times of packet n being sent will increase without bound as n approaches to the infinite.

3.P42:

TCP uses pipelining, which is learned in Operating System class. This enables sender to have multiple segments. The doubling of the timeout interval does not prevent a TCP sender from sending lots of first-time-transmitted packets into the network. So a congestion-control mechanism is needed to extend the flow when there are signs of network congestion.

4.P43:

There is no danger for the receiver to overflow because receiver's buffer can hold the entire file. For there is no loss and acknowledgements are returned before time limit, TCP congestion control does not limit the sender. But, the process in host A will not consistently send data to the socket for buffer is limited. If the buffer is full, the pass rate will be much slower.

5.P30:

a. With timeout values fixed, the senders may timeout a little earlier. So some data may be re-transmitted even they are not lost.

b. If timeout values are estimated, increasing the buffer size helps to increase the throughput of the router. One more thing, queuing delay might be very large.