

CS447-002: Lecture Note (Lecture #9, February 12, 2024)

1. Ask students to come forward and pick up:

- Attendance card
- Quiz #5 question list
- Quiz #5 grades

2. Announcements:

- Quiz #4 has been graded (should be returned at the end)
- Quiz #5 is scheduled this Thursday (2/14)
- A time-keeper wanted (to remind "15 minutes before the end of today)

3. Project #1: using TCP/IP

```
/* create a new TCP/IP socket ----- */
/* AF_INET = "IP" and SOCK_STREAM = "TCP" */
server_socket = socket(AF_INET, SOCK_STREAM, 0);
```

(as in server.cpp)

4. Error control

- Exercises (the one distributed on February 5th): EXERCISE #2 and #3

EXERCISE #2:

Suppose that asynchronous serial data transmission is clocked by two clocks (one at the sender and the one at the receiver) that each has a drift of 2.5 minutes in one year. How long a sequence of bits can be sent before possible clock could cause a problem? Assume that a bit waveform will be good if it is sampled within 32% from the center. Assume that the bit samples are taken at the middle of the clock period. Also assume that at the beginning of the start bit the clock and incoming bits are in phase. Show all your work.

EXERCISE #3:

What is the probability of **non-detectable** error for even parity error detection using the following assumptions (give the formula - you do not have to complete calculation)?

- Bit error rate = 10^{-8}
- Frame size (excluding the start/stop bits) = 8 bits
- Start and stop bits will never cause bit errors.
- Transmission rate = 56.7 Kbps.

- CRC (Cyclic Redundancy Code) error detection (with an exercise)

5. Flow-Control

- Sliding window flow control
- TCP slow-start dynamic window-size control algorithm

6. Quiz #5 review (10 to 15 minutes)