

# Computer Networks

Spring 2022

## Homework Assignment of Week 3 (Link Layer)

Problem 1: Textbook Chapter 6, P6

P5. Consider the 5-bit generator  $G=10011$ , and suppose that  $D$  has the value 1010101010. What is the value of  $R$ ?

Problem 2: Textbook Chapter 3, R9

R9. In our *rdt* protocols, why did we need to introduce sequence numbers?

Problem 3: Textbook Chapter 3, R10

R10. In our *rdt* protocols, why did we need to introduce timers?

Problem 4: Textbook Chapter 3, R11

R11. Suppose that the roundtrip delay between sender and receiver is constant and known to the sender. Would a timer still be necessary in protocol *rdt 3.0*, assuming that packets can be lost? Explain.

Problem 5: Textbook Chapter 3, P9

P9. Give a trace of the operation of protocol *rdt3.0* when data packets and acknowledgment packets are garbled. Your trace should be similar to that used in Figure 3.16.

Problem 6: Textbook Chapter 3, P23

P23. Consider the GBN and SR protocols. Suppose the sequence number space is of size  $k$ . What is the largest allowable sender window that will avoid the occurrence of problems such as that in Figure 3.27 for each of these protocols?