第四章作业如下：

4-1  A group of N stations share a 56-kbps pure ALOHA channel. Each station outputs a 1000-bit frame on average once every 100 sec, even if the previous one has not yet been sent (e.g., the stations can buffer outgoing frames). What is the maximum value of N?

4-2 Measurements of a slotted ALOHA channel with an infinite number of users show that 10% of the slots are idle.

(a) What is the channel load, G?

(b) What is the throughput?

(c) Is the channel underloaded or overloaded?

4-3  What is the baud rate of classic 10-Mbps Ethernet?

4-4  Sketch the Manchester encoding on a classic Ethernet for the bit stream 0001110101.

4-5. A 1-km-long, 10-Mbps CSMA/CD LAN (not 802.3) has a propagation speed of 200m/u sec. Repeaters are not allowed in this system. Data frames are 256 bits long, including 32 bits of header, checksum, and other overhead. The first bit slot after a successful transmission is reserved for the receiver to capture the channel in order to send a 32-bit acknowledgement frame. What is the effective data rate, excluding overhead, assuming that there are no collisions?

4-6  Consider  building a CSMA/CD network running at 1 Gbps over a 1-km cable with no repeaters. The signal speed in the cable is 200,000 km/sec. What is the minimum frame size?

4-7. Ethernet frames must be at least 64 bytes long to ensure that the transmitter is still going in the event of a collision at the far end of the cable. Fast Ethernet has the same 64-byte minimum frame size but can get the bits out ten times faster. How is it possible to maintain the same minimum frame size?

4-8. Suppose that an 11-Mbps 802.11b LAN is transmitting 64-byte frames back-to-back over a radio channel with a bit error rate of 10−7. How many frames per second will be damaged on average?

4-9. A switch designed for use with fast Ethernet has a backplane that can move 10 Gbps. How many frames/sec can it handle in the worst case?

4-10. Store-and-forward switches have an advantage over cut-through switches with respect to damaged frames. Explain what it is.