Q1: Client-server and peer-to-peer
What are some network applications that you use, and for each, do you think they are built using a client-server or peer-to-peer arrangement?

Q2: Telstra vs NBN [Tanenbaum, 5th ed, Ch. 2 Q 19]
“A regional telephone company has 10 million subscribers. Each of their telephones is connected to a central office by a copper twisted pair. The average length of these twisted pairs is 10km. How much is the copper in the local loops worth? Assume that the cross section of each strand is a circle 1mm in diameter, the density of the copper is 9.0 grams/cm³, and that copper sells for 6 dollars per kilogram.”

Q4: Kurose and Ross, Chapter 1, Problem 7
In this problem, we consider sending real-time voice from Host A to Host B over a packet switched network (VoIP). Host A converts analog voice to a digital 64 kbps bit stream on the fly. Host A then groups the bits into 56-byte packets. There is one link between Host A and B; its transmission rate is 2 Mbps and its propagation delay is 10 msec. as soon as Host A gathers a packet, it sends it to Host B. as soon as Host B receives an entire packet, it converts the packet’s bits to an analog signal. How much time elapses from the time a bit is created (from original analog signal at Host A) until the bit is decoded (as part of analog signal at Host B)?

Q5: Kurose and Ross, Chapter 1, Problem 8
Suppose users share a 3 Mbps link. Also suppose each user requires 150 kbps when transmitting, but each user transmits only 10 percent of the time. (See the discussion of packet switching versus circuit switching in Section 1.3.)
   a. When circuit switched is used, how many users can be supported?
   b. For the remainder of this problem, suppose packet switching is used. Find the probability that a given user is transmitting.
   c. Suppose there are 120 users. Find the probability that at any given time, exactly \( n \) users are transmitting simultaneously. (Hint: Use the binomial distribution.)
   d. Find the probability that there are 21 or more users transmitting simultaneously.

Q6: Kurose and Ross, Chapter 1, Problem 10
Consider a packet of length \( L \) which begins at end system A and travels over three links to a destination end system. These three links are connected by two packet switches. Let \( d_i, s_i, \) and \( R_i \) denote the length, propagation speed, and the transmission rate of link \( i, \) for \( i = 1, 2, 3. \) The packet switch delays each packet by \( d_{proc}. \) Assuming no queuing delays, in terms of \( d_i, s_i, \) and \( R_i, \) \( i = 1, 2, 3, \) and \( L, \) what is total end-to-end delay for the packet? Suppose now the packet is 1,500 bytes, the propagation speed on all three links is \( 2.5 * 10^8 \) m/s, the transmission rates of all three links are 2 Mbps, the packet switch processing delay is 3 msec, the length of the first link is 5,000 km, the length of the second link is 4,000 km, and the length of the last link is 1,000 km. For these values, what is the end-to-end delay?