**In class activity - Ch.4 (4.4 IP)**

1. IPv4 was designed in 1970s– three main functions (Fig. 4.12)
   1. IP protocol
   2. Routing (produces fwd tables)
   3. Report errors
2. IPv4 datagram (Fig. 4.13)
   1. Length field
   2. TTL
   3. Protocol
   4. Header checksum vs TCP’s err checksum
   5. Fragment offset
   6. …

🡺20Bytes IP header+20Bytes TCP header + data

1. IP fragmentation (Fig. 4.14 & Table 4.2)
2. IPv4 addressing – 32 bits🡺 ~4 billion addresses
   1. Router can have many interfaces, each interface has a different IP addr. (Fig. 4.15)
   2. CIDR - Subnet addressing (using the higher order bits) – new system
   3. Class A, B, and C subnets – old system

Ex. CoW subnet of class C: a.b.c.d/24 🡺 No. of diff. IP addresses =

Ex. CoW subnet of class B: a.b.c.d/16 🡺 No. of diff. IP addresses =

* 1. ICAN – gives blocks of IP addresses; manages DNS; gives domain names

1. T/F A router can have more than one IP address.
2. T/F In general, a datagram is 1,500 Bytes but can be much larger if needed.
3. A router can break a datagram in two or more fragments. Why would this be needed? Who reassembles the segments?
4. The header checksum of a datagram is recomputed at each router. Why?
5. Give two reasons why IP checksum is not redundant with TCP’s err det. checksum.
6. What field in a datagram tells the Net. layer the corresponding Transp. layer destination?
7. T/F A router discards a datagram having an error detected by the checksum.
8. How many subnets are in Fig. 4.15 and 4.17
9. Explain CIDR at work – Fig. 4.19 (uses address aggregation; similar with zip codes).
10. Redo ex. from pg. 345 for ISP block = 0100/2 with two organizations.   
    Subnet for org. 1: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Subnet for org. 2: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_