2.2. (a) What universal set of communication services is provided by TCP/IP?
(b) How is independence from underlying network technologies achieved?
(c) What economies of scale result from (a) and (b)?

2.5. Why is the transport layer not present inside the network?

4.57. A set of trunks has an offered load of 10 Erlangs. How many trunks are required to obtain a blocking probability of 2%? Use the following recursive expression for the Erlang B blocking probability:

$$B(c,a) = \frac{aB(c-1,a)}{c + aB(c-1,a)} \qquad B(0,a) = 1$$

4.58. Compare the blocking probabilities of a set of trunks with offered load $a = 9$ and $c = 10$ trunks to a system that is obtained by scaling up by a factor of 10, that is, $a = 90$ and $c = 100$. Hint: Use the recursion in Problem 4.57 in a spreadsheet or program.

4.59. Calls arrive to a pool of 50 modems according to a Poisson process. Calls have an average duration of 25 minutes.
(a) What is the probability an arriving call finds all modems busy if the arrival rate is two calls per minute?
(b) What is the maximum arrival rate that can be handled if the maximum acceptable blocking probability is 1%? 10%?