# Transport Layer (1) - Questions

**Q1)** Is it possible for an application to enjoy reliable data transfer even when the application runs over UDP? If so, how?

**Q2)** Suppose that the UDP receiver computes the Internet checksum for the received UDP segment and finds that it matches the value carried in the checksum field. Can the receiver be absolutely sure that no bit errors have occurred? Explain. Would things be different with TCP?

**Q3)** Consider a reliable data transfer protocol that uses only negative acknowledgements. Suppose the sender sends data only infrequently. Would a NAK-only protocol be preferable to a protocol that uses ACKs? Why? Now suppose the sender has a lot of data to send and the end-to-end connection experiences few losses. In this second case, would a NAK-only protocol be preferable to a protocol that uses ACKs? Why?

**Q4)** In protocol rdt3.0, the ACK packets flowing from the receiver to the sender do not have sequence numbers (although they do have an ACK field that contains the sequence numbers of the packet they are acknowledging). Why is that the ACK packets do not require sequence numbers?

**Q5)** Which protocol – Go-Back-N or Selective-Repeat - makes more efficient use of network bandwidth? Why?

**Q6)** If the RTT from London to Cape Sydney is 120ms and all links in the network have a 155 Mbits/second data-rate, how much data can fit in the "pipe"? Hint: Bandwidth Delay Product. Express your answer in bytes.

**Q7)** Consider a TCP connection between Host A and Host B. Suppose that the TCP segments travelling from Host A to Host B have source port number x and destination port number y. What are the source and destination port numbers for the segments travelling from Host B to Host A?