University of Göttingen, Germany

## Homework \#7

## (Due on 12:00am, Thursday, Dec. 10th, 2009)

1. Consider a UDP connection between Host A and Host B. Suppose that the UDP segments traveling from Host A to Host B have source port number 8118 and destination port number 5875. What are the source and destination port numbers travelling from Host $\mathbf{B}$ to Host $\mathbf{A}$.
2. UDP and TCP use 1s complement for their checksums. Suppose you have the following three 8-bit bytes: 01010011, 01010100, 01110100. (Please consider that in case of an overflow bit you have to "wrap it around", cut first bit and add to remaining binary number).

- What is the 1 s complement of the sum of these 8 -bit bytes? (Please note, that UDP and TCP use 16-bit words in reality.) ?
- With the 1 s complement scheme, how does the receiver detect errors?
- Is it possible that a 1-bit error will go undetected? How about 2-bit error?

3. Is it possible for an application to enjoy reliable data transfer even if the application runs over UDP? If so, how? Name and explain the methods.
4. Draw the Finite Sate Machine (FSM) for the receiver side of protocol rdt3.0. Please discuss the correctness of your state machine using the four scenarios from lecture slide 53/54 "rdt3.0 in action".

Telematik - Computer Networks and the Internet

