Telematics

Winter Semester 2008/09

1. Exercise

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General information about the exercises
Accompanying the lecture, we will give out some assignments. You shall do the exercises on your own but you do not have to submit your solutions. The solutions will be presented in the tutorial sessions. We expect each student to have solved the exercises and might ask anyone to present these.

Exercise 1, OSI model:

Name the layers of the OSI model starting from the top and their general functions.

Exercise 2, Path selection:

Which layer determines path selection in an internetwork?

Exercise 3, Physical layer:

What does the physical layer define?

Exercise 4, Casting Information:

Explain the differences of unicast, multicast, and broadcast transmissions. Give an example application for each transmissions type.

Exercise 5, Overhead:

Explain which service type has more overhead - connection-oriented or connection-less?

Exercise 6, Services in a layered communication system:

1. Explain why the layers of a n-level communication system should never use or supply services of/to other layers other than ones below resp. above?
2. Which alternative does exist to a layered communication model? Name an application where this model is more useful.

Exercise 7, Latency and bandwidth:

The terms *latency* and *bandwidth* have been introduced in the lecture. Discuss in which of the following application scenarios latency, bandwidth, or both are most important.

1. FTP
2. SSH
3. Pay-TV video streaming
4. Remote controlled emergency shut-off system
5. Telemedicine in the surgery
6. Access to the world wide web
7. E-Mail

Exercise 8, Asynchronous vs. synchronous transmission:

Name the advantages and disadvantages of asynchronous and synchronous timing schemes.

Exercise 9, Connection Properties:

Define the notion of simplex, duplex, and half-duplex. Give an example medium of each type.

Exercise 10, Terminology:

Explain the terms signal, data, and information in the context of telematics.

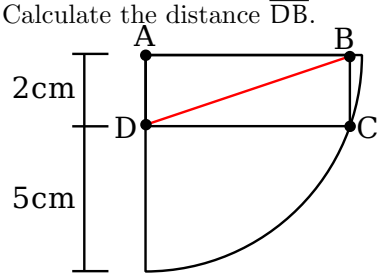
Exercise 11, ISO:

Go the ISO website and find the technical committee 97 that has been introduced in the lecture. What is TC97 working on right now?

Exercises unrelated to telematics. Try to solve these brainteasers if you are interested.

Exercise 12, Brainteaser A:

Calculate the distance $\overline{DB}$.



Exercise 13, Brainteaser B:

The set of a laptop and mouse costs 710 €. The laptop costs 700 € more than the mouse while the laptop costs the price of the set minus the price of the mouse. You want to buy only the mouse and hand the seller a 50 € bill. How much money will you get back?