Ex. 1: Applications

What is a Computer Network and what is it used for? Name and describe at least 8 applications. For every application, list the requirements to the network. E.g., an application could be the downloading of lecture scripts. Requirements for this could be

- high available bandwidth for low download times

- global access to the server, meaning name resolution, routing etc.

Ex. 2: OSI vs. TCP/IP

Read (at least) Sections 1.3 (Network Software) and Sections 1.4 (Reference Models) of Andrew Tanenbaums Computer Networks (I am using the 4th Edition for the pointers).

Ex. 2.1: Comparison

What are his key points comparing OSI and TCP/IP?

Ex. 2.2: Critique

What is his main critique of OSI, what of TCP/IP?

Ex. 3: Bandwidth

You would like to transmit a digital video, e.g., the recording of the last lecture, from Mannheim to Heidelberg (25 km). The size of the video is 1 GB. There are the following alternatives for transmitting:

1. ISDN with 64 KBit/s

2. ATM with 155 MBit/s

3. By car with the video stored on a hard disc (50 km/h).

How long will it take to transmit the video using alternatives (1) – (3)?
Hints:

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\begin{aligned}
1\,[\text{KB}] &= 1024\,[\text{Byte}] \\
1\,[\text{KBit}] &= 1000\,[\text{Bit}]
\end{aligned}
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