
Multimedia Systems

Exercise No. 1

Notes:

- The exercise sheet will be discussed within the exercise course in the following week (Tuesday, 2.00 pm, 32-349).
 - We strongly recommend to deal with the exercise sheets and to attend the exercise course.
 - You can optionally hand in your solutions until Thursday, 12.00 am, room 34-310. They will be corrected till the following lecture.
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1. An ISDN telephone has an integrated low-pass, which filters the incoming voice signal from the mouthpiece.

- a) What is the function of the integrated low-pass?
- b) What is the sampling rate of the ISDN telephone system? Why?
- c) Suppose the low-pass is removed. How would a dialog partner perceive a high sound with a frequency of $f = 7000$ Hz?

2. Calculating with decibel.

- a) Show the following:
 - doubling the power results in a approx. +3 dB
 - a tenfold increase of power results in +10 dB
 - b) How many decibel represents a thousandfold increase of power?
 - c) Speech has a typical power of $10\mu\text{W}$, a violin of 1mW and a speaker of 100W . Calculate the ratio in dB.
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