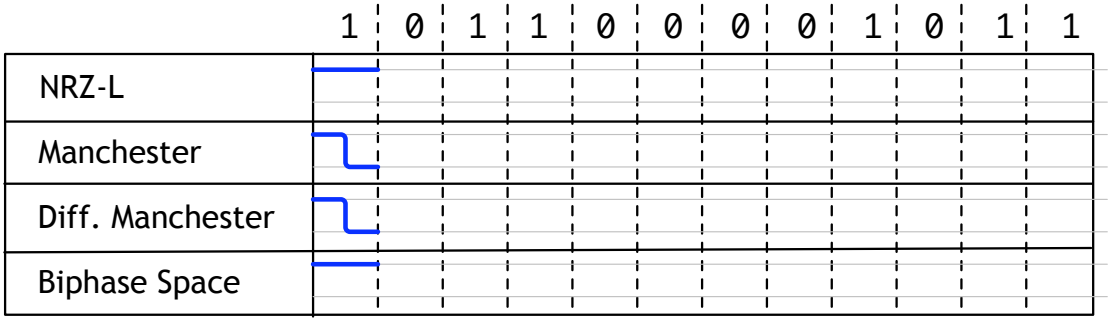
Ex. 1: Line Coding

Ex. 1.1: Encode

Encode the following bit string using the given transmission techniques:



Ex. 1.2: Delay

Consider a transmission medium where a signal change between 0 V and 5 V needs at least 10^{-9} sec. How many bit values can be transmitted in 1 sec using the techniques from subtask (a)? Consider the worst case as well as the best case.

Ex. 1.3: Statement

Which of the following statements are correct?

- Biphase space is not appropriate for clock recovery.
- Manchester codes are more suitable for synchronization than NRZ codes.
- Cable breaks are easier to discover using NRZ codes than Manchester codes.
- Manchester codes have a lower direct current (DC) component than NRZ codes.

Ex. 2: Physical Layer

1. What is modulation?
2. Which modulation techniques do you know and what are their differences?
3. Explain the difference between modulation and multiplexing?
4. Give two kinds of multiplexing and explain them.
5. Which of the following statements is correct?
   - Using frequency multiplexing, the channels may not overlap.

- Asynchronous time multiplexing always exploits the transmission medium better than synchronous time multiplexing does.
- Using frequency multiplexing, the width of the wave bands is always the same.
- Using time multiplexing, the channels may not overlap.
- Inevitably, a constant bit rate is guaranteedthrough asynchronous time multiplexing.

Ex. 3: SS 2004—Exercise 1

Dowload the Computer Network Exam of Summer Semester 2004 (`http://www.informatik.uni-mannheim.de/pi4/lib/info/examination/`) and solve exercise 1 using a stop watch.