

Homework Set #8

The intention is that you do the exercises yourself. Oral discussion (without using pen/paper) between students is allowed, but the solution should be written down individually.

The homework must be submitted one day before each tutorial session either on paper (before 6 PM) or via email (before mid night).

Every correctly solved problem gives 1 point, partially correct gives 0.5 point, mostly wrong 0 point.

Numbers below refer to problems in the text book: Amos Lapidoth, “A Foundation in Digital Communication”.

1. Exercise 27.3

2. Exercise 27.4

3. Exercise 27.9

Hint: (Part i) Express the terms in the likelihood ratio in terms of hyperbolic cosines:

$$\cosh(x) = \frac{e^x + e^{-x}}{2}.$$

Note that $\cosh(x)$ is monotonically increasing in $|x|$.

4. Exercise 28.1

5. Exercise 28.5

6. Exercise 28.8

7. Exercise 28.9