NIE-AIB — Homework 2 – 13.10.2022

Instructions.

Complete the exercises and write your solutions on papers. Comment your solutions sufficiently. **A result alone without the solution is insufficient**. Submit your solutions to the MS Teams assignment "NIE-AIB, Homework 2" no later than October 26.

1 Exercise 1.

Factorize $x^8 - 1$ over F_3. Find all cyclic codes of length 8 over F_3 and find the number of cyclic codes of length 8 over F_3. HINT: all factors are linear or quadratic.

2 Exercise 2.

Find all cyclic codes of length 7 over F_2 and their generator polynomials.

3 Exercise 3.

Construct a Reed-Solomon code $RS(6, 4)$ over F_7 and find a generator matrix and a parity check matrix for this code. Use $\alpha = 3$ as the generator of F_7^*.