

## ASSIGNMENT 7

Let  $f = x^3 + x + 1$  and let  $F = \mathbb{Z}_2[x]/f$ . Let  $\alpha \in F$  be  $\alpha = x + 1$ . Show that  $\text{ord}(\alpha) = 7$ . Write  $H_{3,2}$  as a  $2 \times 7$  matrix whose entries are powers of  $\alpha$  and as a  $6 \times 7$  binary matrix whose entries are elements of  $\mathbb{Z}_2$ . Determine the dimension of  $BCH(3, 2)$ .