

Exercise on the chapter
“Linear recurrences with constant coefficients”

To prepare for 14 November 2024

Exercise 1. Let \mathbb{K} be an effective field.

(a) Show that if $P \in \mathbb{K}[x]$ has degree d , then the sequence $(P(n))_{n \geq 0}$ is C-recursive, and admits $(x - 1)^{d+1}$ as a characteristic polynomial.

(b) Deduce that P can be evaluated at the $N \gg d$ points $1, 2, \dots, N$ in $O(N M(d)/d)$ operations in \mathbb{K} .