TCSlib Blueprint

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Chapter 1

This is a Test

In this chapter, this is a test.

Lemma 1.1 (Welch-Berlekamp Algorithm)**.** *If there is a polynomial f with degree at most $k-1$ such that $\Delta(f, w) \leq e$, then there exists E and Q satisfying:*

- *$deg(E(X)) = e$ and $E(X)$ is monic.*

- *$deg(Q(X)) \leq e + k - 1$.*

- *$w_i \cdot E(\alpha_i) = Q(\alpha_i)$ for all $i = 1, ..., n$.*

Proof. Consider the error-locator polynomial of the form

$$E(X) = \Pi_{i:f(a_i) \neq y_i}(x - a_i).$$

$\square$

Lemma 1.2 (Jensen)**.** *If S is a finite set, and $\sum_{s \in S} w_s = 1$ for some non-negative w_s, and $p_s \in [0, 1]$ for all $s \in S$, then*

$$\sum_{s \in S} w_s h(p_s) \leq h(\sum_{s \in S} w_s p_s).$$