Computing recurrence relations of truncated polynomials

Let $R$ be a commutative ring and $s = (s_j)_{j \in \mathbb{N}_0}$ a sequence of elements of $R^n$ for some $n \in \mathbb{N}$. The recurrence ideal or annihilator $\text{Ann}(s)$ of $s$ is the set of all polynomials $f = \sum_{i=0}^{n} f_i x^i$ which satisfy

$$\sum_{i=0}^{n} f_i s_{k+i} = 0 \text{ for all } k \geq 0.$$

Recurrence relations play an important role in mathematics and computer science, and their (efficient) computation is an interesting problem.

Hyun, Neiger, and Schost published algorithms to compute the recurrence ideal of sequences in $R^n$ where $R = \mathbb{K}[x]/(x^d)$ of truncated polynomials [1].

The aim of thesis is to research the literature, explain the theory in thorough detail and implement the algorithms in SageMath.


For further details and literature talk to

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