Submodule approach to creative telescoping by
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Abstract. In their 1999 paper, Hendriks and Singer introduced Liouvillian solutions of linear difference equations with rational function coefficients. The proved that finding such solutions if they exist reduces to finding first order factors of certain auxiliary equations. Recently, an algorithm and implementation to find higher order factors has become available. This raises the question how to generalize the definition of Liouvillian solutions in order to benefit from this new capability, how to design a corresponding solver, and how to prove its completeness for this more general class of solutions.