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First Order Differential and Difference Systems in Sage

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We present a new package that provides users with the necessary tools to work with first order linear difference and differential systems in the computer algebra system `Sage` [2]. In its first version, the package under the tentative name `FOS` [1] supports many essential features for differential and difference systems in one variable, including computation of polynomial, rational, and formal solutions, super-reduction, desingularization, conversion to scalar equations, and more. We give a tutorial on how to use the package and show its capabilities in several examples.

Keywords
Systems of differential equations, systems of difference equations, Sage

References
[1] M. JAROSCHEK, FOS. `http://www.mjaroschek.com/fos/`
[2] THE SAGE DEVELOPERS, SageMath, the Sage Mathematics Software System. `http://www.sagemath.org`