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Taylor Series Solution of Some Real Life Problems: ODEs & PDEs

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Abstract

Recently He et al. (missing citation) derived an analytical solution of the system of Lane-Emden equations by using the Taylor series method and computed a closed-form solution of the system of Lane-Emden equations subject to given initial conditions. In this work, this method is further explored and extended to a class of nonlinear ODEs, PDEs, a system of Nonlinear ODEs and PDEs subject to certain Initial conditions and boundary conditions. In some cases, we could find exact solutions and if that is not possible then we compute approximate solutions. We have compared these solutions with other existing techniques and showed that the method is simple and superior to other existing iterative techniques. We have also provided Mathematica codes which user may find useful and can compute solutions as per their need.

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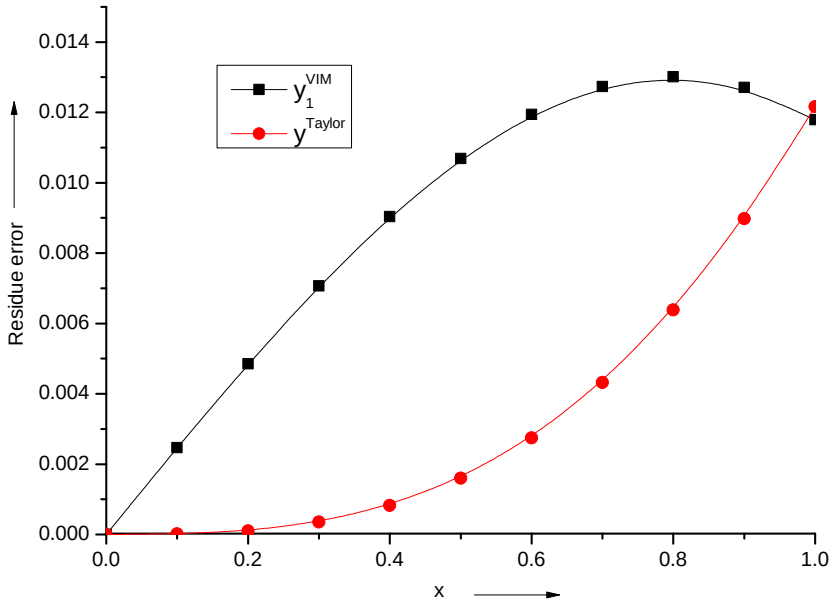

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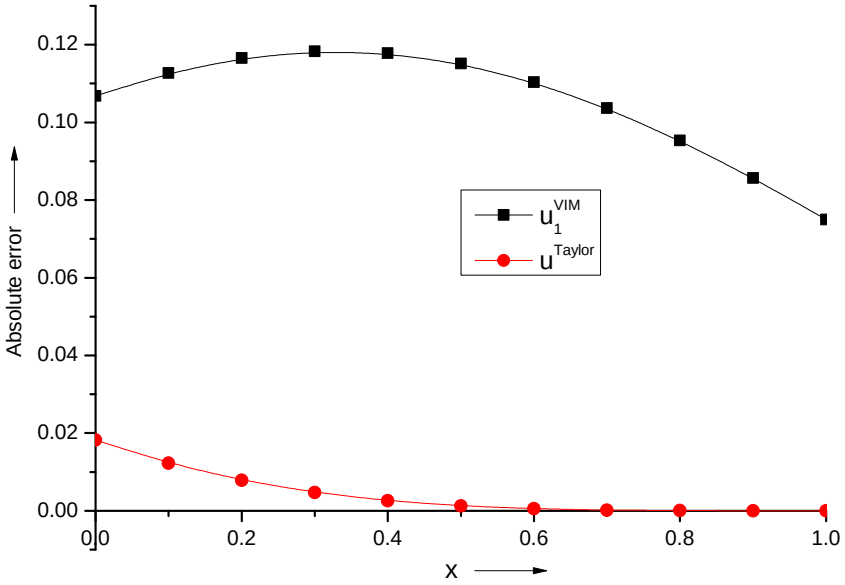

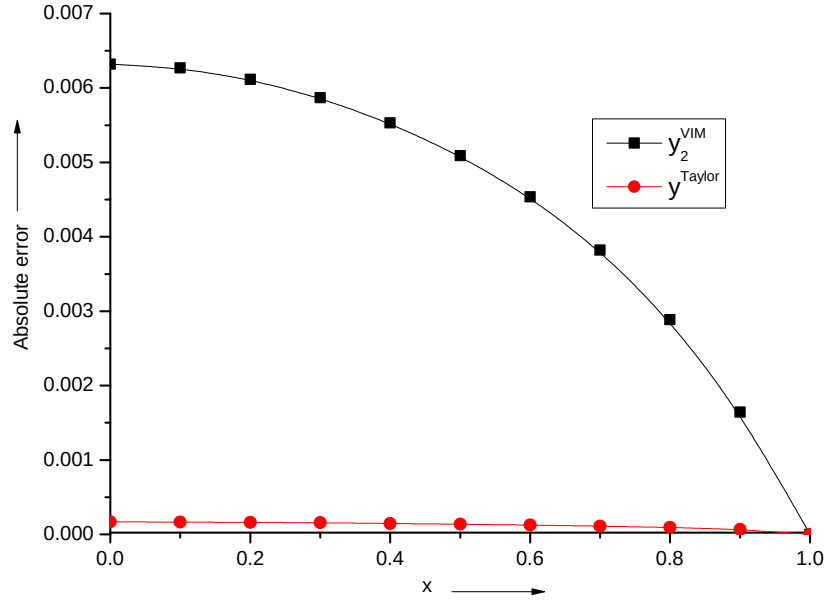

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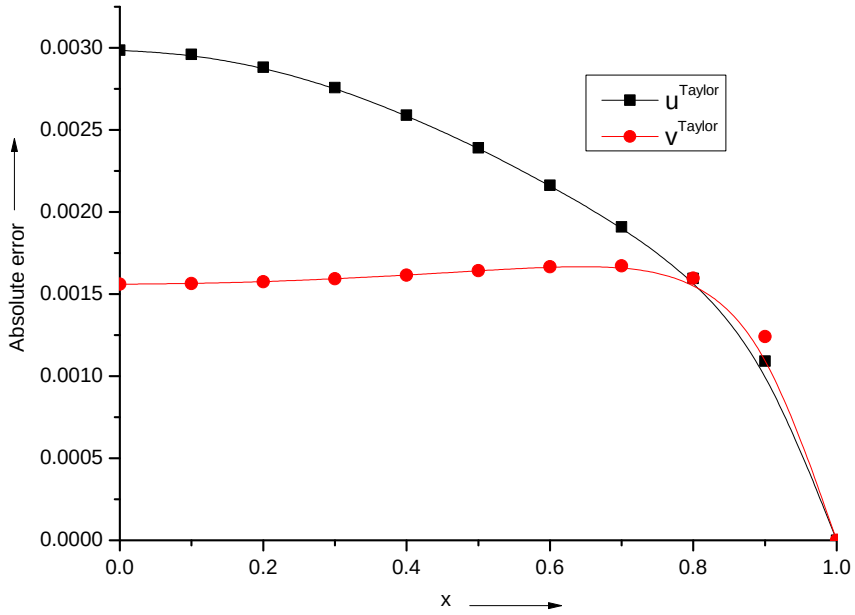

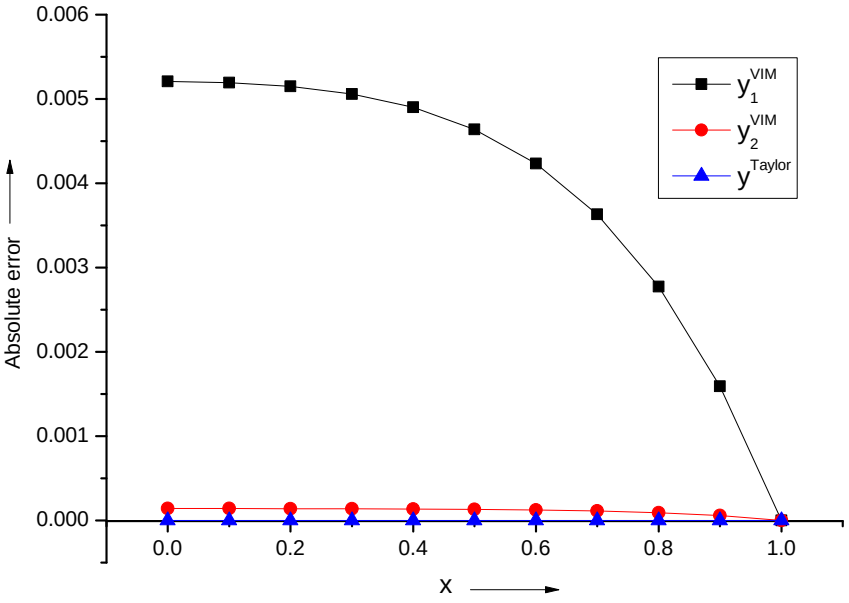

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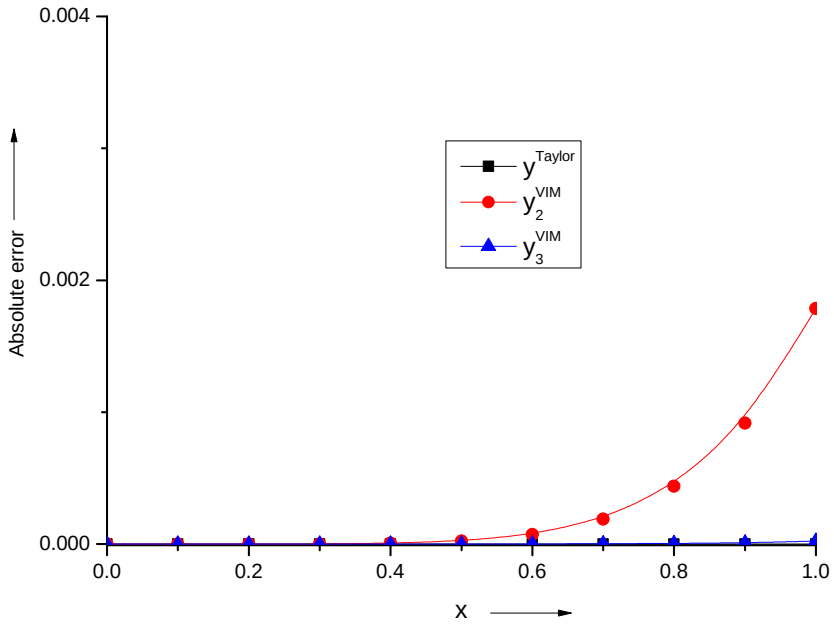

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