MORGAN CADLE and JASON MILLER, Department of Computer Sciences, Mathematics, and Engineering, Shepherd University, Shepherdstown, WV, 25443. Solving Ordinary Differential Equations in Java.

Ordinary Differential Equations (ODEs) are equations containing multivariate derivatives of one or more function with respect to a single independent variable. ODEs are components of mathematical models used in biology, chemistry and physics. Solving ODEs can be lengthy and difficult. We investigated the complexity challenges of developing Java programs that solve ODEs within the context of undergraduate study. We evaluated the relative difficulty of writing a program in plain Java, using a Java library specific to ODEs, and solving the equations without programming. This study could help students and instructors find new ways to explore the complexity of ODE problems and generate new methods for solving them with computers.