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Modeling Bodies of Revolution in Calculus. Preliminary report.

A common exercise in many second semester calculus courses is to calculate the volume of bodies of revolution, for example see Stewart, *Calculus – Concepts and Contexts*, Chapter 6. We propose an exercise to model a rotationally symmetric object that students have brought to class, such as a vase, bottle, or glass. Through the use of open source software and a computer algebra system, we give a method of taking a digital image of a real life object with rotational symmetry, and creating a mathematical model from the image. We can use either *Mathematica* or *Maple*, depending on institutional licensing, or an open source alternative, such as *Sage*, to display a 3D rendering of the mathematical model and to calculate the volume. The resulting volume can be compared to the volume of the actual object; depending on available class time, students can measure the volume by submersion in water or other approach. (Received September 17, 2012)