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In this talk we will discuss the creation and implementation of weekly computer-based labs for our linear algebra students using SageMathCloud, a free cloud-based mathematical computing environment. Some of the lab topics were the electronic game Lights Out, Hamming codes, image manipulation, and Google PageRank. The goals of this lab were to provide an opportunity for our students to become familiar with coding, and to explore interesting applications of linear algebra topics from class. The talk will include how we introduce our students to coding using SageMath, survey feedback from students about their interpretations of the labs, examples of the labs, and how we assess students' lab performance. (Received September 22, 2017)