Introducing computational thinking with free software in a math for liberal arts course

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This poster reports on incorporating a suite of free software, including R, into an introductory math class for the liberal arts. The course was designed to give an appreciation of mathematics to students with no college math background in majors that may not require them to take another math class. In this case, the flexible course goals and the features of **GNU Emacs** and free software were combined to promote learning relevant to computational thinking.

GNU Emacs is a powerful text editor that has been actively developed for over 25 years. It is built around a full programing language, Emacs Lisp, and ported to every major computing platform [1]. Beyond its text editing capabilities, **Emacs** is capable of serving as a platform-independent computing environment. This computing environment combined with the free software licenses under which many powerful programs are released has made possible the pre-configured portable cross platform software suite used in this course [2]. With this suite, setup for the course was reduced to copying a software folder to a student accessible drive.

In the course, computer use was motivated by the topics through which the course evolved. We turned to the computers to illustrate concepts, to work on puzzles, and as means to write up assignments. After the students accepted the unfamiliar computing interface, they passed among a number of programs in the software environment seamlessly and with steadily increasing confidence.

In conclusion, the course required minimal computing setup, had good learning outcomes, and course evaluations were excellent. The approach taken in this course could be incorporated into an introductory statistics course or developed into a course on computational thinking.

References

[1] Free Software Foundation, *GNU Emacs–GNU project–Free Software Foundation(FSF)*, http://www.gnu.org/software/emacs, 1996–2010.

[2] Panayotis Giannakouros, *Statlive*, http://www.statlive.org, 2007–2010.