

Algorithms, Recursion and Induction: Euclid and Fibonacci

Desh Ranjan*

Notes to the instructor

The project provides an opportunity to introduce students to the notion of algorithms, recursion and induction. It allows them to explore the interrelationship between recursion and iteration in a mathematical sense. Simultaneously, it introduces them to the idea of computational efficiency and rate of growth of functions. It provides a setting where students can perform basic efficiency analysis of an algorithm using induction which reinforces the usefulness of learning the technique. By judiciously selecting the tasks from the list of all tasks, the project can be used in a sophomore or junior level discrete mathematics or algorithms course. The instructor should consider spending more time on tasks in section 1 to ensure that the students feel comfortable with simple recursive definitions if they are not familiar with them already.

*Department of Computer Science, Old Dominion University, Norfolk, VA 23529; dranjan@cs.odu.edu.