



6.006—Introduction to Algorithms Profs Sрни Devadas and Ron Rivest

6.006 is an introduction to algorithms for MIT students who have taken 6.01 and 6.042 (or the equivalents). It is organized into seven “modules”, each of which is organized around a motivating problem and an algorithmic theme. Homework will include significant programming assignments in Python. It will be taught (with limited enrollment) Fall 2007 and every term thereafter. Text will be Cormen/Leiserson/Rivest/Stein *Introduction to Algorithms*, with Miller/Ranum *Problem Solving with Algorithms and Data Structures* recommended.

Module 1: Introduction/Python/Analysis/OOP

Problem 1: Comparing the “distance” between the complete works of William Shakespeare and those of Winston Churchill.

Module 2: Hashing

Problem 2: Finding the longest common substring between mouse and human genomes.

Module 3: Dynamic Programming

Problem 3: Figuring out how rich you could be today, if you started out with \$1000 on the day of your birth, and knew the future.

Module 4: Sorting and Priority Queues

Problem 4: In a two-dimensional simulation of a gas, finding all pairs of colliding molecules quickly.

Module 5: Graph Search

Problem 5: Computing the diameter of the state graph for Rubik’s 2x2x2 cube.

Module 6: Shortest Paths

Problem 6: Computing the shortest path from CalTech to MIT, along US interstate highways.

Module 7: Numerical Computation

Problem 7: Computing the millionth digit of $\sqrt{2}$.