

Lecture 1: Monday January 6, 2003

today

- welcome to CS204 ☺
- official course info
- course overview
- intro

official course information

- course page <http://www.cs.ualberta.ca/~hayward/204/CS204.html>
- grade: quizzes 44% (best 4 of 5) midterm 17% final 39%
- deferred final: Friday May 2, 1-4pm, room TBA
- text: Intro. to Alg'ms (2nd edition) Cormen/Leiserson/Rivest/Stein
- these Winter 2003 UofA CS204 lecture notes follow CLRS

announcements

- problem set #1 available now
- no seminars this week

course(s) overview

- 204 Alg'ms I
 - introduction to algorithms
 - algorithms: sort/search, matrices, graphs, sets
 - design: divide/conquer, greedy, dyn. programming
 - analysis: model assumptions, worst/avg./best case, asymptotic, reduction, complexity classes P/NP, hard problems
 - calendar/outline with reading list on homepage

role of alg'ms in computing [CLRS Ch. 1]

- algorithm
- typical problems
 - bioinformatics
 - internet (routing, search, mining, ...)
 - e-commerce
 - operations research (resource management, scheduling, ...)
- hard problems
- alg'ms as a technology: time/space management

basic concepts

- problem
- algorithm
- issues for a given algorithm
 - correctness
 - * often via loop invariants, proved by induction
 - analysis: measuring resource requirements
 - * running time
 - * space
 - optimality
- algorithm design concepts
 - divide and conquer
 - data structure
 - dynamic programming
 - exhaustive enumeration
 - greedy
 - reduction (useful for showing problems are ‘hard’)
 - others (probably won’t cover)
 - * backtracking
 - * branch and bound