CS 758/858: Algorithms

Summary

http://www.cs.unh.edu/~ruml/cs758

Summary
- Topics
- Criteria
- Everything Else
- Break
- Feedback
- Wildcard

Summary

What We've Covered

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Week	Class	Date	Topic	Book	Due
			sorting		
1	1	Aug 28	big-O, sorting	2, 3	
	2	Aug 30	more sorting	8	
2	[no lecture Sep 4: Labor Day]				asst 1 (radix sort)
	3	Sep 6	heaps	7, 6	
			searching		
3	4	Sep 11	hashing	11, 16	asst 2 (quicksort)
	5	Sep 13	binary trees	12	
4	6	Sep 18	red-black trees	13	asst 3 (babbler)
	7	Sep 20	red-black deletion		
5	8	Sep 25	tries		asst 4 (I/O scheduling)
			optimization		
	9	Sep 27	dynamic programming	14	
6	10	Oct 2	knapsack		asst 5 (spelling correction)
	11	Oct 4	more DP		
7	[no lecture Oct 9: Midsemester]				
	12	Oct 11	parsing		asst 6 (sequence alignment)
8	13	Oct 16	greedy	15	
			graphs		
	14	Oct 18	graph traversal	20	asst 7 (parsing)
9		Oct 23	Midterm Exam (in class)		
	15	Oct 25	union-find, components	19	
10	16	Oct 30	spanning trees	21	asst 8 (algorithm design)
	17	Nov 1	shortest paths	22	
11	18	Nov 6	all pairs paths	23	asst 9 (MST halftoning)
	[recitation on Nov 7: Election Day, Friday schedule]				
	19	Nov 8	network flow	24	
	[no recitation Nov 10: Veterans Day]				
12	20	Nov 13	matching, LPs	24.3, 29	asst 10 (route planning)
			NP-completeness		
	21	Nov 15	NP-completeness	34	
13	22	Nov 20	satisfiability		asst 11 (flow)
	[no lecture Nov 22 or recitation Nov 24: Thanksgiving]				
14	23	Nov 27	clique		asst 12 (NP proof)
	24	Nov 29	undecidability		
15	25	Dec 4	approximation	35	asst 13 (NP proof)
			coping with NP-completeness		
	26	Dec 6	backtracking		
16	27	Dec 11	wildcard slot		asst 14 (algorithm design)
		Dec 14	Final Exam, 10:30am-12:30pm? (finalized by registrar in Nov)		

How to Choose an Algorithm

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- running time
- memory use
- solution quality (for optimization problems)
- guarantees on time, memory, or cost
- implementation complexity
  - correctness of algorithm & implementation
  - ease of testing
  - time to write
  - ease of maintenance
- generality
- popularity
  - ease of maintenance
  - correctness
- input required

Everything Else

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- topics
  - geometry
  - strings
  - cryptography
  - numerical analysis
  - FFT
- approaches
  - randomized algorithms
  - on-line algorithms
  - parallel, distributed
  - cache-oblivious
  - external memory
  - models: quantum, DNA

Break

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- final exam: Thu Dec 14 10:30am-12:30pm, Kingsbury N121
- no books, notes, gadgets, ...
- covers entire class with emphasis since midterm

Feedback

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We do read these.
They are anonymous and public.

There should be one for me and one for the TA — please fill out both!

Assignment most in need of revision?

Wildcard

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Time for the wildcard topic!