Other Announcements

will start running this weekend.

it-bug for problems with submission, your code, the any of our software.

lab assistants needed. Consider volunteering to be b assistant for CS 10, self-paced courses, CS 61A, or semester.

Contest: Visit my web page for information about the amming contest, which we hold each fall. There are ions of programming problems you can try your hand on.

Public-Service Announcement

litical Review Our Fall 2017 magazine is out! Fea- es on topics ranging from universal basic income to avery in Mauritania to the housing crisis in Berkeley, r's magazine features more quality pieces than ever s, is free of charge to Berkeley students! Stop by n Sproul 9am–5pm this week to grab your copy."

Lecture #40: Course Summary

language: Java

lysis

f data structure: Java library structure

om numbers

plementation topics

Programming-Language Topics

d programming: organizing around data types

nted programming:

s. static type

ce

terface vs. implementation

ramming (the <···> stuff).

el: containers, pointers, arrays

es

and semantics

xtent

oms, patterns:

sed as functions (e.g., Comparator)

plementations (e.g., AbstractList)

., sublists)

alysis and Algorithmic Techniques

analysis

), $\Theta(\cdot)$ notations

average case.

ime

and dynamic programming.

jor Categories of Data Structure

terface and its subtypes

e and its subtypes

eton implementations of collections, lists, maps (`AbstractList`,

ncrete collection and map classes in Java library

Sequences

l double link manipulations

rrays
es, deques
fering
costs of basic operations

Trees

s: search, representing hierarchical structures
ions: insertion, deletion
sals
g trees

Searching

s, range searching
onal searches: quad trees.

es and heaps
es
ng by rotation (red-black trees)
y construction (B-trees)
tic balance (skip lists)

s, trade-offs

Sorting

ing
rt
rting

d selection
sort

f various algorithms, when to use them?

Random numbers

s
eudo-random sequence
uential and additive generators
tributions:
the range
rm distributions
ndom selection

Graph structures

represented by graphs
sal: the generic traversal template
traversal, breadth-first traversal
ort
ths
ning trees, union-find structures
agement as a graph problem.

Debugging

gers can do
o pin down bugs
me debugger (Eclipse, gjdb, various Windows/Sun prod-

what it means, how to use it.
nics.

A Case Study

t version-control system as an example of a design using
s from this course.

and tree structures represented with files as vertices
file names), rather than machine addresses, as pointers.

ing to create unique (or very, very likely to be unique)
abilistic data structure.

uses various kinds of map to facilitate conversion to
npressed form, including arrays, tries, and hash tables

e in Huffman coding.

Version Control

?

ts behind our particular system:

copy vs. repository copy

g changes

and merging changes.

What's After the Lower Division?

Interface Design (Hartmann)

uter Security (Popa)

ating Systems and System Programming (Joseph, Ragan-

ramming Languages and Compilers (Hilfinger)

cient Algorithms and Intractable Problems (Chiesa, Vazi-

binatorics and Discrete Probability (Friedman)

hics (Ng)

bases

ficial Intelligence (Dragan, Levine)

hine Learning

orted Special Topics: Computational Design and Fabri-
gning, Visualizing and Understanding Deep Neural Net-

Assorted Side Trips

essing.

agement and garbage collection.

at's After the Lower Division? (II)

puter Architecture (Asanovic)

raduate courses: including advanced versions of 152,
), 184, 186, 189; plus Cryptography, VLSI design and
topics.

se, EE courses!

rtunities for participating in research and independent

t's After the Lower Division? (III)

S are just two of over 150 subjects!

offer more specific skills and exposure to real prob-

think that CS is a creative activity that (to the true
t to fun!