CS 171: Introduction to Computer Science II

Project Workshop and Review

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Announcements/Reminders

• Final: Thursday, 12/13, 4:30 – 7pm
• Final review and practice exam will be posted today
• Quiz 4 (and all quizzes/midterms) available tomorrow
• Extra office hours this week
  – M 11:30 - 12:30pm
  – Tu 11:30 - 12:30pm
  – W 10:30 - 11:30am
• Project due: Friday, 12/14, 11:59pm
Today

• Quick review
• Project workshop
• Course evaluation
Summary of Data Structures

• General purpose data structures
  – Arrays
  – Linked lists
  – Trees
  – Hashtable

• Specialized data structures
  – Stacks
  – Queues, priority queues
  – Graphs
Specialized data structures

• Stacks
  – Push, pop

• Queues
  – Insert, remove

• Priority queues
  – Insert, removeMin/removeMax
  – Binary heaps

• Graphs
  – List of edges, adjacency matrix, adjacency list
  – BFS and DFS traversal algorithms
  – Shortest paths for unweighted graphs (BFS)
  – Shortest path for weighted graphs (Dijkstra, A*)
Summary of Algorithms

• Associated with each data structure
  – Insert
  – Delete
  – Search/find
  – Traversal
  – Graph algorithms

• Sorting
  – Bubble, insertion, selection
  – Merge sort
  – Quicksort
Algorithm Analysis

• Big-O notation
• Common functions
  – constant, logarithm, linear, quadratic, polynomial, exponential, factorial in increasing order of growth
• Cost analysis
  – Direct methods
  – Recursive relations (specially useful for recursive algorithms)
Parting thoughts

• You have learned a great deal!
• Beginning at the end
• Thank you for a great semester and would love to hear from you or see you in a future class!
Project Workshop

• Project design – class design, algorithm design, data structures, GUI design
• Project development – development, debugging, integration
• Project experience – interesting and challenging aspects, lessons learned
• Application Demo – program features, desired features/remaining work
Project Workshop Program

• FaceSpace
  – Nathanie
  – Milap and Sushi
  – Akshay
  – Carly
  – Justin and Taylor

• MapQuest
  – Liqi and Fei