Lecture 41: Summary

CSCI 62
Fall, 2016

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Topics

- Object-oriented Programming in Java
  - Encapsulation, information hiding for flexibility!
- Proofs by induction for correctness & complexity *(more in Discrete Math)*
- Big-O complexity – performance
  - Sorting & searching: selection, insertion, merge, quicksort, heapsort, binary search, tree & graph algos

More Topics

- Basic Data Structures including alternate implementations:
  - Lists
  - Stacks
  - Queues
  - Trees - including (balanced) binary search trees
  - *Maps & Dictionaries (including hash tables)*
  - *Graphs, including sophisticated algorithms*
  - *Understand trade-offs in selection of data structures*

Topics in italics covered since last midterm

More Topics

- Parallelism & Concurrency
- *C Programming*
  - *Differences between Java & C*
  - *Explicit pointers & manual memory management!*

Place of CS 62

- Last core course with focus on teaching to program.
  - Though will learn other languages later.
  - Further courses focus on core topics & applications
- Assume now comfortable in creating medium sized programs
  - There are courses, e.g. CS 121 Software Design & CS 181 Software Engineering, that focus on designing large programs

Goals from Syllabus

- Good understanding of the object-oriented design, coding, and debugging of programs in Java and C
- Good understanding of how one might analyze programs for correctness and efficiency
- Understand the trade-offs involved in selections of different data structures and algorithms to solve computational problems.

Choice of Language

- What is important?
  - If programmer time: Use high-level garbage-collected language like Java, Python, ML, Haskell, Scala, Javascript, etc.
  - If execution time (and need access to low-level details): Systems language like C, Objective C or Swift, or C++.
- Students taking 105 (Systems) and graphics will need to be sure C is solid.

Final Exam

- Thursday at 9 a.m.
- 7 to 10 questions (some w/many parts)
  - several involve coding in C & Java
  - Lots of analysis of data structures, descriptions/ analysis of algorithms covered in class -- including graphs!
  - More emphasis on items since second midterm
    - but cumulative!

Office Hours

- Today: 11 to noon & 2 to 3 p.m.
- Reading & Exam week: 2 to 3 p.m.
  - Except Monday: 3 to 4 p.m..
- Final Grade Calculation:
  - 15% each midterm plus 25% final
  - 35% programming assignments
  - 10% labs + quizes

Questions?