6.00 Introduction to Computer Science and Programming
Fall 2008

Topics Covered in 6.00, Fall 2008

or, Things To Know For The Final:

- Algorithms
    - Big O notation
    - Exhaustive enumeration
    - Guess and check
    - Successive approximation
    - Divide and conquer algorithms
    - Binary search
    - Merge sort
    - Greedy algorithms
    - Optimization problems
        - Knapsack problems
    - Depth first search and backtracking
    - Dynamic programming
    - Decision trees
    - Orders of growth
        - Exponential
        - Polynomial
        - Linear
        - Log
    - Amortized analysis

- Linguistic issues
    - Values, types, expressions variables
    - Builtin types: int, float, string, list, dictionary
    - Mutability and aliasing
    - Control flow and iteration
    - Functions and methods
    - Input/output
    - Recursion and call stacks
    - Exceptions
    - Polymorphism
    - Modules
    - Classes and objects
    - Pylab

- Simulation
    - Random walks
    - Monte Carlo methods

- When you should believe the answer

- Understanding data
  - Building computational models
  - Uniform, normal, and exponential distributions
  - Linear regressions
  - Evaluating fits
    - Over fitting
  - Statistical sins
    - Texas sharpshooter
    - Data enhancement
    - Non-representative sample
    - cum hoc ergo propter hoc
  - Plotting

- Software engineering
  - Debugging and testing
  - Data abstraction and inheritance
  - Program organization
    - Specifications

- Anything needed to successfully complete problem sets