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

• Software engineering
  o Debugging and testing
  o Data abstraction and inheritance
  o Program organization
    ▪ Specifications

• Anything needed to successfully complete problem sets