CS 2123 Midterm 1 Topics

- Stable matching problem
  - Gale-Shapley algorithm (apply if given a preference list)
  - Identifying an unstable pair
- Python
  - Basic syntax and operation
  - Access and manipulation of built-in data structures: dictionaries, lists, tuples, sets
  - List comprehensions
  - Defining and invoking methods
  - Note: you will not be asked to re-write any code implementing algorithms provided to you in class
  - You should be comfortable reading and interpreting code, including implementation of algorithms covered in class and minor variants thereof
- Algorithm Analysis
  - Bounding functions: Big Oh, Omega, Theta definition and application
  - Dominance: definition (including little oh) and application
  - Worst-case vs. best-case vs. average case performance
- Graph algorithms
  - Graph representation in Python
  - Representing problems as graphs
  - Induction-based topological sort
  - DFS and BFS traversal
- Balanced Binary Search Trees
  - AVL trees: performance, balance factors, insertion
  - B-trees: performance, insertion, deletion, tree-height key storage calculation
  - Tradeoffs in selecting AVL vs B-trees