

## Brief Review for Exam 1

Subjects covered:

- Asymptotic analysis
  - Best/Worst/Average performance (time and space)
  - Big-O notation and properties
    - Lower order terms, sum, product
    - Loop, consecutive statements, conditional statements
  - Growth rates of commonly used formulas
    - L'Hospital's rule
- ADT and template class/functions
  - What are template classes, why need them, how they differ from regular classes
- Lists
  - Basic operations and their time performance
  - Linked list implementation (single, double, circular)
  - Basic idea of Stacks and queues and their operations
- Trees
  - Rooted trees
    - Tree height, node depth and height, path length
    - Binary and K-ary tree and their nodes
  - Binary tree (BT)
    - Full, perfect, and complete BT
    - Internal and external nodes, IPL, EPL
    - Different orders of traversals
  - Binary search tree (BST)
    - Basic operations and their time performance (find, findMin, findMaxinsert, remove, makeEmpty)

Types of questions:

- Similar to those on the review pages
- Definitions
- Proofs (especially inductions)
- Coding (some may require using operations already defined in the class)
- Applying operations to specific example problems