METROPOLITAN STATE UNIVERSITY™
OF DENVER
Department of Mathematical and Computer Sciences

CS 2050 - Computer Science II (Spring 2020)

Final Exam Topics

- the main method overrides from the Object class in Java: toString, equals, and clone;
- array list: definition, static vs. dynamic, visual representation, pros and cons, basic operations (create, add, indexing, print, etc.), basic use;
- linked list (singly only): definition, detailed implementation using specialized and generic node types, visual representation, pros and cons, basic operations (create, add/head insert, append/tail insert, check for emptiness, indexing, insert, remove, print, etc.), basic use (instantiation, given a sequence of method calls be able to describe the state of a list, given a state of a list be able to describe the sequence of methods to get to that state);
- queues: definition and operating model, static vs. dynamic queue implementation, pros and cons, basic operations (push, pop, peek, and queue, print), basic use (similar to what was said about linked list), priority queues;
- stacks: definition and operating model, static vs. dynamic stack implementation, pros and cons, basic operations (push, pop, peek, and queue, print), basic use (similar to what was said about linked list);
- recursion: definition, implementation, base-case, call stack / stack frames, the stack overflow error;
- the exhaustive search algorithm: goal, implementation, disadvantage of a queue implementation;
- linear search: goal, implementations (with/without assumption);
- algorithm complexity and the big O notation;
- sorting algorithms: selection sort, insertion sort, and merge sort;
- the Comparable<T> interface and the compareTo method (applications on sorting and binary search trees);
- trees: definition, terminology, binary search trees, implementation, complexity of the binary search algorithm, tree traversals (pre-order, in-order, post-order, level-order), recursive traversal using the call stack, applications of binary trees (expression trees, decision trees);
- hash tables: definition, hash functions, collisions, hash table implementation, traversal;
- the Iterable<T> interface and iterator implementations for all of the ADTs discussed in class.

You may be asked to read code and answer questions about it.