

COSC 201 Review Questions
Midterm #1
Fall 2009

- 1.) Write the code to create an enhanced for loop that will go through every member of an ArrayList <String> myArray and print it out to the console.
- 2.) Give the code to create an array of strings of size 10 called myStrings.
- 3.) What is the difference between Object and Class?
- 4.) What is the difference between TreeSet and HashSet?
- 5.) Give an algorithm to solve the maximum subsequence sum problem in less than $O(n^3)$ time.
- 6.) Define static.
- 7.) Give the code to create a class called Student that IS-A Person. The class Student should have one field a double called gpa. Be sure to create the constructor, toString, accessors and mutators for Student. The constructor will take in 5 parameters: String n, int ag, String ad, String p, double g and assume that the constructor for Person is formatted: Person(String n, int ag, String ad, String p).
- 8.) What is an IS-A relationship?
- 9.) Give the code to create an interface called myInterface. The interface should have two methods, add and remove. Add has two parameters, int a and int b. Remove has one parameter, int idx.
- 10.) Give the code to implement an interface called Whee. Whee's interface definition:

```
public interface Whee {  
    public int add2ints(int a, int b);  
}
```

Your implementation of this interface should include simply the methods needed.

- 11.) Define algorithm analysis.
- 12.) What is the time complexity of this snippet of code:

```
for (i = 0; i < n; i++)  
    for (j = 0; j < n; j++)  
        for (k = 0; k < n; k++)
```

```
System.out.println(k*i*j);
```

- 13.) Give the code to create an Iterator for the ArrayList myArray. Use that Iterator to print out the elements in myArray.
- 14.) What is the interface for Iterator?
- 15.) Name 5 of the 8 methods in the Collection interface.
- 16.) Name the three implementations of List in the Java API.
- 17.) Give the code to add a ListNode element called k between ListNode i and ListNode j in a LinkedList. You can assume that the node has already been created for the element.
- 18.) Is the LinkedList implemented by the Java API a singly-linked list or a doubly-linked list?
- 19.) Give the code to declare and instantiate a Stack of strings called myStack. Then add the elements "This" "is" "COSC" "201", and then print out those elements.
- 20.) How do you implement a Stack with a Linked List?
- 21.) What is recursion?
- 22.) Give the recursive method for the summation of integers from 1 to N.
- 23.) Create a class Student with two private fields id (an integer) and name (a String). Include a useful constructor as well as methods to allow Student to be put into a HashSet and sorted with Collections.sort. Students should be compared by name.
- 24.) Give the recursive method to find the Fibonacci sequence number at a given index i (i.e. the ith number in the sequence).
- 25.) Given the following set of number {1, -4, 3, 2, 12, -8, -9, 18}, what is the maximum contiguous subsequence sum for said set?
- 26.) Define a comparator for a class Student that will be compared via an integer field id.