(a) List all of the ways a student can lose 50% or more on an assignment.

(b) Circle the bullet in front of each statement that accurately describes your instructor's course policies:

- The final exam for this course will be comprehensive.
- Lab attendance is required.
- If you miss more than three lectures, your grade will be dropped by half a letter grade.
- You must submit every lab assignment in order to pass this course.
- All students must submit a copy of their lecture notes before the end of the day.
- Having a copy of all or part of another student's source code, just to look at for a little help, is considered cheating.
- Your instructor is such a nice guy that if you turn in an assignment 45 minutes late, he wouldn't consider it late.
- Your instructor will give you a free lunch if you invite him to lunch.

Do not circle the bullet in front of any statement that incorrectly describes your instructor's course policies.
Feel free to provide an explanation for your answer if you believe the statement to be ambiguous.

Implement the following method from the simple ArrayList class that we have been developing in lecture. You may use size() but no other methods from the ArrayList class in your implementation.

```
public boolean addAll(Collection<? extends E> collection) {
  boolean isChanged = false;
```

```
  return isChanged;
}
```

Implement the following method from the simple ArrayList class that we have been developing in lecture. You may use size() but no other methods from the ArrayList class in your implementation.

```
public boolean removeAll(Collection<? extends E> collection) {

}
```

Consider the simple LinkedList class that we have been developing in lecture. Recall that the class has two attributes:

```
private Node head;
private int size;
```

and that the inner Node class has two attributes:

```
private E element;
private Node next;
```

Suppose that the size attribute of the LinkedList class is removed. Implement the size() method for the modified class. You may not make use of any other methods in the LinkedList class.

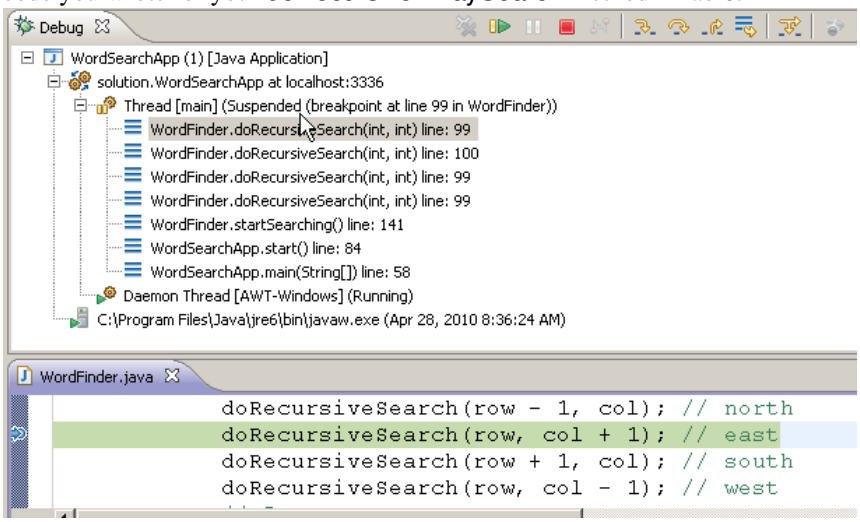
```
public int size() {

}
```

Draw the UML class diagram for a CircularQueue class. Implement the constructor and enqueue methods.

What is the purpose of generics in the Java language? Give a concrete example (write code) that illustrates your answer.

The screen capture below is from running a recursive algorithm that is very similar to the code you wrote for your doRecursive4WaySearch method in lab 6.



Suppose the algorithm is acting on the grid of letters below and was started on the letter **H** (doRecursiveSearch(0, 0).

H	E	A	S
I	L	P	O
M	R	D	C
N	U	T	G

What is the current value of currentWord in the running of the program suspended by the debugger? Explain your answer.

In lab 7 you used an ArrayList to store the Entrys in your LookupTable. Suppose that the Internal Revenue Service now wishes to use the LookupTable to store all tax returns (based on the filer's Social Security number). Assume your implementation made correct use of the Collections.binarySearch() method.

(a) Consider replacing the ArrayList with a LinkedList. Would this be better, equivalent, or worse? Explain your answer.

(b) Suppose the LookupTable class was modified to make use of a balance binary search tree instead of the ArrayList/Collections.binarySearch() implementation. Would this be better, equivalent, or worse? Explain your answer.

(c) Consider two possible ways of adding all of the Entrys to the LookupTable: 1) added in ascending order based on social security number and 2) added in random order.

Of the three implementations described above (ArrayList, LinkedList, balanced binary search tree) which implementation would have the greatest variation in execution time to add all of the tax returns to the LookupTable object? Justify your answer.

Consider the following three binary trees. For each tree that is a red-black tree, color the nodes (use circles to represent red and squares to represent black). For each tree that is not a red-black tree, indicate why it is not a red-black tree.