

Name: _____ Andrew Id: _____

15-121 Fall 2019 Quiz 5

Up to 21 minutes. No calculators, no notes, no books, no computers. Show your work!

1. Short Answer

(a) (3 points) What is the difference between using `super()` and using `super`?

(b) (3 points) What is the difference between an abstract data type and a data structure?

2. (4 points) **Few-Liner:** Write **four lines** of code that finish the method below. (Note: Lines containing only a { or } do not count as lines.) If you can't solve it in four lines, then feel free to use more lines for half-credit.

```
// Return an ArrayList containing all the elements of arr doubled.  
// For example: [1,2,3] becomes an ArrayList containing 2, 4, and 6.  
public static ArrayList<Integer> doubleArray(int[] arr) {
```

```
}
```

3. (10 points) **Free Response:** Consider the following class:

```
public class Vehicle {
    private String plate;
    private String owner;

    public Vehicle(String plate, String owner) {
        this.plate = plate;
        this.owner = owner;
    }

    public String toString() {
        return "Plate #" + this.plate + " owned by " + this.owner;
    }
}
```

Write a new class, `Truck`, that is-a `Vehicle`. Your `Truck` class must function as follows:

```
Vehicle firstVehicle = new Truck("121", "Sheikh Kabeer", 7, 2020);
System.out.println(firstVehicle);
// Prints: Truck with Plate #121 owned by Sheikh Kabeer expires on 7/2020

Vehicle secondVehicle = new Truck("634876", "John Smith", 10, 2022);
System.out.println(secondVehicle);
// Prints: Truck with Plate #634876 owned by John Smith expires on 10/2022
```

Note: Your solution *must* properly apply the principals of inheritance. Writing a `Truck` class that does not properly inherit from `Vehicle` and make use of `Vehicle`'s methods and data will not receive points.

Write your answer on the next page. Do **not** write it on this page.

Answer space for Question 3.