Name: _____ Andrew Id: _____

15-121 Fall 2018 Quiz 4

Up to 15 minutes. No calculators, no notes, no books, no computers. Show your work!

There are questions on *both sides* of this paper.

1. **Short Answer:** Answer each of the following *in just a few words.*

    (a) (2 points) What's the relationship between a superclass and a subclass?

    (b) (2 points) What is the difference between an abstract data type and a data structure?

    (c) (2 points) If you call `super()`, what does that do?

2. (2 points) **Multiple Choice:** By convention, which visibility modifier should you apply to most instance variables in classes you create?

    A. `public`

    B. `protected`

    C. none

    D. `private`

    E. `secret`

3. (2 points) **One-Liner:** Write a **single line** of code that finishes the method below. If you can't solve it in one line, then feel free to use more lines for half-credit.

```
// Return true if a and b contain all the same values,
// and false otherwise.
public boolean areEqual(int[][] a, int[][] b) {




}
```

4. (10 points) **Free Response:** Consider a file containing lines of characters separated by semicolons. The number of characters per line is not fixed. Some lines don't contain anything. Write the public method endSum which, given a filename, returns a string containing the concatenation of all of the last characters from each line. If a line has no characters, then simply ignore it. If you would like, you may assume you can use the public static Scanner getFileScanner(String filename) method given in both the notes and the homework.

Consider this example. If input.txt contains the following:

```
a;q;g;m;e;c;j;n;h;j;c
p;c;v;c;h;a;a

w;j;z;u;t
x;q;w;x;q;e;s
```

Then endSum("input.txt") would return "cats".