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15-121 Fall 2022 Quiz 4

Up to 20 minutes. Show your work. No calculators, no notes, no books, no computers, no other people.

1. (10 points) **Free Response:** Consider a file containing lines of words separated by commas. The number of words per line is not fixed. Write the public static method `uniqueWords` which, given a filename, returns an `ArrayList` of all of the *unique* words in the file (meaning no duplicates).

If there is an error opening the file, return `null`.

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

```
cat,dog,bear,tiger
spider,ant,cockroach
thing
alien,spider,bear,tiger,human
```

Then `uniqueWords("input.txt")` would return an `ArrayList` containing:

```
[cat, dog, bear, tiger, spider, ant, cockroach, thing, alien, human]
```

2. (6 points) **Code Tracing:** Indicate what the following program prints. Place your answer (and nothing else) in the box under the code.

```
public class Quiz4CT {
    private int a;
    private int b;
    private int c;

    public Quiz4CT(int a, int b) {
        this.b = a;
        this.a = b;

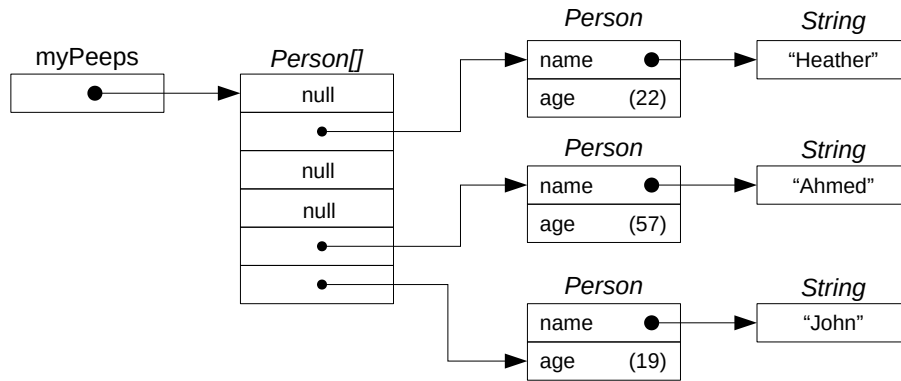
        for (int i = a; i < b; i++) {
            c += i;
        }
    }

    public void mystery(int d, int a) {
        c = a / b + d;
        int t = a;
        a = b;
        b = t;
    }

    public String toString() {
        return "a: " + this.a + ", b:" + this.b + ", c:" + this.c;
    }

    public static void main(String[] args) {
        Quiz4CT q1 = new Quiz4CT(3, 5);
        System.out.println(q1);
        q1.mystery(7, 15);
        System.out.println(q1);
    }
}
```

3. (4 points) **Code From Picture:** Consider the following picture:



Assuming the `Person` class exists and has a constructor that takes `name` and `age` as arguments, write the appropriate lines of code to create the correct variables and objects that match what you see pictured above. Your code does not need to be inside of a method or a class. (This is a short code snippet.)