

Solutions for Section #4

Problem 1: Word Count

```
public class WordCount extends ConsoleProgram {

    public void run() {
        int lines = 0;
        int words = 0;
        int chars = 0;

        BufferedReader rd = openFileReader("File: ");
        try {
            while (true) {
                String line = rd.readLine();
                if (line == null) break;
                lines++;
                words += countWords(line);
                chars += line.length();
            }
            rd.close();
        } catch (IOException ex) {
            println("An I/O exception has occurred");
        }

        println("Lines = " + lines);
        println("Words = " + words);
        println("Chars = " + chars);
    }

    /**
     * Asks the user for the name of an input file and returns a *
     * BufferedReader attached to its contents. If the file does * not exist,
     * the user is given another chance to try.
     */
    private BufferedReader openFileReader(String prompt) {
        BufferedReader rd = null;
        while (rd == null) {
            String name = readLine(prompt);
            try {
                rd = new BufferedReader(new FileReader(name));
            } catch (IOException ex) {
                println("Can't open that file.");
            }
        }
        return rd;
    }
}
```

```

/**
 * Counts the words (consecutive strings of letters and/or digits) * in the
 * input line.
 */
private int countWords(String line) {
    boolean inWord = false;
    int words = 0;
    for (int i = 0; i < line.length(); i++) {
        char ch = line.charAt(i);
        if (Character.isLetterOrDigit(ch)) {
            inWord = true;
        } else {
            if (inWord) words++;
            inWord = false;
        }
    }
    if (inWord) words++;
    return words;
}
}

```

Problem 2: Array Tracing

Array	Final Array Contents
{10, 8, 9, 5, 5}	{10, 9, 9, 6, 6}
{12, 11, 10, 10, 8, 7}	{12, 12, 11, 11, 9, 8}

Problem 3: How Unique!

```

public class UniqueNames extends ConsoleProgram {

    public void run() {
        ArrayList<String> list = new ArrayList<String>();
        while (true) {
            String name = readLine("Enter name: ");
            if (name.equals(""))
                break;
            if (!list.contains(name)) {
                list.add(name);
            }
        }
        println("Unique name list contains:");
        printList(list);
    }

    private void printList(ArrayList list) {
        for (int i = 0; i < list.size(); i++) {
            println(list.get(i));
        }
    }
}

```

Problem 4: Histogram

```
public class Histogram extends ConsoleProgram {

    private static final String DATA_FILE = "MidtermScores.txt";

    private int[] histogramArray;

    public void run() {
        initHistogram();
        readScoresIntoHistogram();
        printHistogram();
    }

    private void initHistogram() {
        histogramArray = new int[11];
        for (int i = 0; i <= 10; i++) {
            histogramArray[i] = 0;
        }
    }

    private void readScoresIntoHistogram() {
        try {
            BufferedReader rd = new BufferedReader(new FileReader(DATA_FILE));
            while (true) {
                String line = rd.readLine();
                if (line == null) break;
                int score = Integer.parseInt(line);
                int bucket = score / 10;
                histogramArray[bucket]++;
            }
        } catch (IOException e) {
            throw new RuntimeException(e);
        }
    }

    private void printHistogram() {
        for (int i = 0; i <= 10; i++) {
            String label = null;
            if (i == 0) {
                label = "00-09";
            } else if (i == 10) {
                label = " 100";
            } else {
                label = (10 * i) + "-" + (10 * i + 9);
            }
            String stars = createStars(histogramArray[i]);
            println(label + ": " + stars);
        }
    }

    private String createStars(int num) {
        String str = "";
        for (int i = 0; i < num; i++) {
            str += "*";
        }
        return str;
    }
}
```