

CSE142 Sample Final Exam Key
Summer 2019

1. The program produces the following output:

```
108 [5, 10, 14]
8 [5, 10, 14]
20 8
```

2. Original Array

Final Array

Original Array	Final Array
[2, 3, 1]	[2, 3, 1]
[2, 6, 3, 5]	[2, 6, 4, -2]
[3, 3, 7, 9]	[3, 3, 0, 9]
[2, 4, 5, 6, 8]	[2, 4, 2, 6, 4]
[1, 5, 8, 4, 10, 9]	[1, 5, 4, -1, 10, 11]

3. The program produces the following output:

```
Eins
Eins 1
Zwei 2   Eins 1
```

```
Eins
Eins 1
Eins 2
```

```
Vier Drei
Drei 1
Zwei 2   Drei 1   Vier 2
```

```
Drei
Drei 1
Zwei 2   Drei 1
```

4. Two possible solutions:

```
public static void formatList(Scanner input) {
    while (input.hasNextLine()) {
        String text = input.nextLine();
        if (!text.startsWith(".")) {
            System.out.println(text);
        } else {
            while (text.startsWith(".")) {
                System.out.print(" ");
                text = text.substring(1);
            }
            System.out.println("* " + text);
        }
    }
}

public static void formatList(Scanner input) {
    while (input.hasNextLine()) {
        String line = input.nextLine();
        int indent = 0;
        while (indent < line.length() && line.charAt(indent) == '.') {
            indent++;
        }
        line = line.substring(indent);
        for (int i = 0; i < indent * 4; i++) {
            System.out.print(" ");
        }
        if (indent > 0) {
            System.out.print("* ");
        }
        System.out.println(line);
    }
}
```

5. One possible solution:

```
public static void calculateGrade(Scanner file) {
    int hwPoints = 0;
    int hwPoss = 0;
    int examPoints = 0;
    int examPoss = 0;

    while (file.hasNext()) {
        String type = file.next();
        int score = file.nextInt();
        int poss = file.nextInt();

        if (type.equalsIgnoreCase("Homework")) {
            hwPoints += score;
            hwPoss += poss;
        } else if (type.equalsIgnoreCase("Exam")) {
            examPoints += score;
            examPoss += poss;
        }
    }

    double hwPct = (double) hwPoints / hwPoss * 100;
    double examPct = (double) examPoints / examPoss * 100;
    System.out.println("Homeworks: " + hwPoints + " / " + hwPoss + " = " + hwPct);
    System.out.println("Exams: " + examPoints + " / " + examPoss + " = " + examPct);

    double overall = (hwPct + examPct) / 2;
    System.out.println("Overall grade: " + overall);
}
```

6. Three possible solutions:

```
public static boolean sweep(int[] a) {
    boolean changed = false;
    for (int i = 0; i < a.length - 1; i++) {
        if (a[i] > a[i + 1]) {
            int temp = a[i];
            a[i] = a[i + 1];
            a[i + 1] = temp;
            changed = true;
        }
    }
    return changed;
}
```

```
public static boolean sweep(int[] a) {
    int count = 0;
    for (int i = 0; i < a.length - 1; i++) {
        if (a[i] > a[i + 1]) {
            int temp = a[i];
            a[i] = a[i + 1];
            a[i + 1] = temp;
            count++;
        }
    }

    if (count > 0) {
        return true;
    } else {
        return false;
    }
}
```

```
public static boolean sweep(int[] a) {
    int count = 0;
    for (int i = 1; i < a.length; i++) {
        int temp1 = a[i];
        int temp2 = a[i - 1];

        if (a[i - 1] > a[i]) {
            a[i - 1] = temp1;
            a[i] = temp2;
            count++;
        }
    }

    if (count > 0) {
        return true;
    } else {
        return false;
    }
}
```

7. Two possible solutions:

```
public static void reverse3(ArrayList<Integer> list) {
    for (int i = 0; i < list.size() - 2; i += 3) {
        int n1 = list.get(i);
        int n3 = list.get(i + 2);
        list.set(i, n3);
        list.set(i + 2, n1);
    }
}

public static void reverse3(ArrayList<Integer> list) {
    for (int i = 0; i < list.size() - 2; i += 3) {
        list.add(i, list.remove(i + 2));
        list.add(i + 2, list.remove(i + 1));
    }
}
```

8. One possible solution:

```
public class Sponge extends Critter {
    private int dashCount;
    private int turnCount;

    public Sponge() {
        dashCount = 1;
        turnCount = 0;
    }

    public Action getMove(CritterInfo info) {
        if (info.getFront() == Neighbor.OTHER) {
            dashCount++;
            return Action.INFECT;
        } else if (info.getFront() == Neighbor.EMPTY) {
            return Action.HOP;
        } else {
            dashCount = Math.max(dashCount - 1, 1);
            turnCount++;
            if (turnCount % 3 == 1) {
                return Action.LEFT;
            } else {
                return Action.RIGHT;
            }
        }
    }

    public Color getColor() {
        return Color.YELLOW;
    }

    public String toString() {
        String result = "[";
        for (int i = 0; i < dashCount; i++) {
            result = result + "-";
        }
        return result + "]";
    }
}
```

9. Two possible solutions:

```
public static int[] maxes(int[] arr1, int[] arr2) {
    int length = Math.max(arr1.length, arr2.length);
    int[] result = new int[length];

    for (int i = 0; i < length; i++) {
        if (i >= arr1.length) {
            result[i] = arr2[i];
        } else if (i >= arr2.length) {
            result[i] = arr1[i];
        } else if (arr1[i] > arr2[i]) {
            result[i] = arr1[i];
        } else {
            result[i] = arr2[i];
        }
    }

    return result;
}

public static int[] maxes(int[] arr1, int[] arr2) {
    int[] result = new int[Math.max(arr1.length, arr2.length)];
    int shorter = Math.min(arr1.length, arr2.length);

    for (int i = 0; i < shorter; i++) {
        if (arr1[i] > arr2[i]) {
            result[i] = arr1[i];
        } else {
            result[i] = arr2[i];
        }
    }

    for (int i = shorter; i < result.length; i++) {
        if (i >= arr1.length) {
            result[i] = arr2[i];
        } else {
            result[i] = arr1[i];
        }
    }

    return result;
}
```

10. Four possible solutions:

```
public static String undouble(String s) {
    if (s.length() <= 1) {
        return s;
    }
    String res = "";
    for (int i = 0; i < s.length() - 1; i++) {
        char next = s.charAt(i);
        if (next == s.charAt(i + 1)) {
            i++;
        }
        res += next;
    }

    if (s.length() > 1) {
        if (s.charAt(s.length() - 1) != s.charAt(s.length() - 2)) {
            res += s.charAt(s.length() - 1);
        }
    }
    return res;
}
```

```
public static String undouble(String s) {
    String result = "";
    if (s.length() > 0) {
        char last = s.charAt(0);
        result += last;
        for (int i = 1; i < s.length(); i++) {
            if (s.charAt(i) != last) {
                result += s.charAt(i);
            }
            last = s.charAt(i);
        }
    }
    return result;
}
```

```
public static String undouble(String str) {
    if (str.length() == 0) {
        return "";
    }
    String result = "";
    char prev = str.charAt(0);
    result += prev;

    for (int i = 1; i < str.length(); i++) {
        char curr = str.charAt(i);
        if (curr != prev) {
            result += curr;
        }
        prev = curr;
    }

    return result;
}
```

```
public static String undouble(String s) {
    for (int i = 0; i < s.length() - 1; i++) {
        if (s.charAt(i) == s.charAt(i + 1)) {
            s = s.substring(0, i) + s.substring(i + 1);
        }
    }
    return s;
}
```