CSE 142, Summer 2013
Midterm Exam Key

1. Expressions

Expression	Value
`12 / 3 + 5 + 3 * -2`	`3`
`2 + 2 + "(2 + 2)" + 2 + 2`	`"4(2 + 2)22"`
`13 / 2 - 38 / 5 / 2.0 + (15 / 10.0)`	`4.0`
`3.0 / 1.5 – 6 / 4 – 10.0 / 2 / 2`	`-1.5`
`20 % 6 + 6 % 7 + 1 % 6`	`9`

2. Parameter Mystery

```
9 + 4 = 2
2 + 10 = 4
12 + 12 = 13
2 + 10 = 2
```

3. If/Else Simulation

Method Call	Output
`ifElseMystery(5, 5);`	`16 4`
`ifElseMystery(18, 4);`	`2 6`
`ifElseMystery(3, 6);`	`5 8`
`ifElseMystery(0, 0);`	`11 -1`

4. While Loop Simulation

Method Call	Output
`whileMystery(5, 7);`	`2 -2 -2`
`whileMystery(4, 20);`	`16 13 11 10 10`
`whileMystery(10, 4);`	`30 21 13 6 0 0`
`whileMystery(5, 15);`	`10 6 3 1 0 0`

5. Assertions

	c > 3	d <= m	c == 0
Point A	NEVER	ALWAYS	ALWAYS
Point B	NEVER	SOMETIMES	SOMETIMES
Point C	SOMETIMES	ALWAYS	NEVER
Point D	NEVER	NEVER	ALWAYS
Point E	ALWAYS	ALWAYS	NEVER

6. Programming

There are many ways to solve any programming problem. Here are some common correct solutions we saw:

```
public static void printListMin(Random r, int count) {
    int num = r.nextInt(90) + 10;
    int min = num;
    System.out.print(num);
    for (int i = 1; i < count; i++) {
        num = r.nextInt(90) + 10;
        min = Math.min(min, num);
        System.out.print(", " + num);
    }
    System.out.println();
    System.out.println("min was " + min);
}

public static void printListMin(Random r, int count) {
    int min = 99;
    for (int i = 1; i < count; i++) {
        int num = r.nextInt(90) + 10;
        min = Math.min(min, num);
        System.out.print(num + ", ");
    }
    int num = r.nextInt(90) + 10;
    min = Math.min(min, num);
    System.out.println(num);
    System.out.println("min was " + min);
}
```

7. Programming

```
public static int randomArt(int size, int frequency) {
    Random r = new Random();
    int count = 0;
    for (int i = 0; i < size; i++) {
        for (int j = 0; j < size; j++) {
            int c = r.nextInt(1 + frequency);
            if (c == 0) {
                System.out.print("*");
                count++;
            } else {
                System.out.print("+");
            }
        }
        System.out.println();
    }
    return count;
}

public static int randomArt(int size, int frequency) {
    Random r = new Random();
    int count = 0;
    for (int i = 1; i <= size; i++) {
        for (int j = 1; j <= size; j++) {
            double c = r.nextDouble();
            if (c < 1.0 / (frequency + 1)) {
                System.out.print("*");
                count++;
            } else {
                System.out.print("+");
            }
        }
        System.out.println();
    }
    return count;
}
```

8. Programming

```
public static int countParitySwitches(int value) {
    int lastDigitParity = value % 2;
    int count = 0;
    value /= 10;
    while (value > 0) {
        if (value % 2 != lastDigitParity) {
            count++;
        }
        lastDigitParity = value % 2;
        value /= 10;
    }
    return count;
}
```

```
public static int countParitySwitches(int value) {
    boolean lastDigitEven = value % 2 == 0;
    int count = 0;
    value /= 10;
    while (value > 0) {
        if ((value % 2 == 0) != lastDigitEven) {
            count++;
        }
        lastDigitEven = value % 2 == 0;
        value /= 10;
    }
    return count;
}
```

```
public static int countParitySwitches(int value) {
    int count = 0;
    while (value / 10 > 0) {
        int last = value % 2;
        value /= 10;
        if (last != value % 2) {
            count++;
        }
     }
     return count;
 }
```

```
 // tricky—observe that if (n + n / 10) % 2 == 0, then both n and n/10 are either
 // odd or even (because odd+odd=even and even+even=even), but if (n + n / 10) % 2 == 1,
 // then one of n or n/10 must be even and the other must be odd (because even+odd=odd)
 public static int countParitySwitches(int value) {
     int count = 0;
     while (value >= 10) {
         int old = value;
         value /= 10;
         count += (old + value) % 2
     }
     return true;
 }
```