CSE143X Section #10 Problems

1. Consider the following method:

```
public int mystery1(int x, int y) {
    if (x < y) {
        return x;
    } else {
        return mystery1(x - y, y);
    }
}
```

For each call below, indicate what value is returned:

Method Call	Value Returned
mystery1(6, 13)	_____
mystery1(14, 10)	_____
mystery1(37, 10)	_____
mystery1(8, 2)	_____
mystery1(50, 7)	_____

2. Consider the following method:

```
public void mystery2(int n) {
    if (n <= 1) {
        System.out.print(n);
    } else {
        mystery2(n / 2);
        System.out.print(", " + n);
    }
}
```

For each call below, indicate what output is produced by the method:

Method Call	Output Produced
mystery2(1)	_____
mystery2(4)	_____
mystery2(16)	_____
mystery2(30)	_____
mystery2(100)	_____

3. Consider the following method:

```
public int mystery3(int n) {
    if (n < 0) {
        return -mystery3(-n);
    } else if (n < 10) {
        return n;
    } else {
        return mystery3(n / 10 + n % 10);
    }
}
```

For each call below, indicate what value is returned:

Method Call	Value Returned
mystery3(6)	_____
mystery3(17)	_____
mystery3(259)	_____
mystery3(977)	_____
mystery3(-479)	_____

4. Consider the following method:

```
public int mystery4(int n) {
    if (n < 0) {
        return mystery4(-n);
    } else if (n < 10) {
        return n;
    } else {
        return n % 10 + mystery4(n / 10);
    }
}
```

For each call below, indicate what value is returned:

Method Call	Value Returned
mystery4(8)	_____
mystery4(74)	_____
mystery4(-52)	_____
mystery4(3052)	_____
mystery4(82534)	_____

5. Consider the following method:

```
public int mystery5(int x, int y) {
    if (x < 0) {
        return -mystery5(-x, y);
    } else if (y < 0) {
        return -mystery5(x, -y);
    } else if (x == 0 && y == 0) {
        return 0;
    } else {
        return 100 * mystery5(x / 10, y / 10) + 10 * (x % 10) + y % 10;
    }
}
```

For each call below, indicate what value is returned:

Method Call	Value Returned
mystery5(5, 7)	_____
mystery5(12, 9)	_____
mystery5(-7, 4)	_____
mystery5(-23, -48)	_____
mystery5(128, 343)	_____

6. Consider the following method:

```
public void mystery6(int x, int y) {
    if (y == 1) {
        System.out.print(x);
    } else {
        System.out.print(x * y + ", ");
        mystery6(x, y - 1);
        System.out.print(", " + x * y);
    }
}
```

For each call below, indicate what output is produced:

Method Call	Output Produced
mystery6(4, 1)	_____
mystery6(4, 2)	_____
mystery6(8, 2)	_____
mystery6(4, 3)	_____
mystery6(3, 4)	_____

7. Consider the following method:

```
public void mystery7(int n) {
    if (n <= 0) {
        System.out.print("*");
    } else if (n % 2 == 0) {
        System.out.print("(");
        mystery7(n - 1);
        System.out.print(")");
    } else {
        System.out.print("[");
        mystery7(n - 1);
        System.out.print("]");
    }
}
```

For each call below, indicate what output is produced by the method:

Method Call	Output Produced
mystery7(0)	_____
mystery7(1)	_____
mystery7(2)	_____
mystery7(4)	_____
mystery7(5)	_____

8. Consider the following method:

```
public void mystery8(int n) {
    if (n > 100) {
        System.out.print(n);
    } else {
        mystery8(2 * n);
        System.out.print(", " + n);
    }
}
```

For each call below, indicate what output is produced:

Method Call	Output Produced
mystery8(113)	_____
mystery8(70)	_____
mystery8(42)	_____
mystery8(30)	_____
mystery8(10)	_____

9. Consider the following method:

```
public void mystery9(int x) {
    if (x < 10) {
        System.out.print(x);
    } else {
        int y = x % 10;
        System.out.print(y);
        mystery9(x / 10);
        System.out.print(y);
    }
}
```

For each call below, indicate what output is produced:

Method Call	Output Produced
`mystery9(7);`	_____
`mystery9(38);`	_____
`mystery9(194);`	_____
`mystery9(782);`	_____
`mystery9(3842);`	_____

10. Consider the following method:

```
public void mystery10(int n) {
    System.out.print("+");
    if (n >= 10) {
        mystery10(n / 10);
    }

    if (n % 2 == 0) {
        System.out.print("-");
    } else {
        System.out.print("*");
    }
}
```

For each call below, indicate what output is produced by the method:

Method Call	Output Produced
`mystery10(5)`	_____
`mystery10(15)`	_____
`mystery10(304)`	_____
`mystery10(9247)`	_____
`mystery10(43269)`	_____

11. Consider the following method:

```
public static void mystery11(List<Integer> data) {
    if (data.isEmpty()) {
        data.add(0);
    } else {
        int n = data.remove(0);  // returns value removed
        mystery11(data);
        if (n < 0) {
            data.add(-n);
        } else if (n > 0) {
            data.add(n);
        }
    }
}
```

Assume that a variable called list of type List<Integer> has been declared and that we make the call mystery11(list). For each initial value of list in the table below, indicate what would be stored in the list after the call

List before	List after
[1, 2, 3]	_____
[-1, -2, -3]	_____
[5, 0, 0, 4, -3, -2, 7, 0]	_____
[2, 4, -6, -8, 0, 10, 0, -12]	_____
[0, 3, -2, 4, 0, 15]	_____