

CS 142 Sample Midterm Exam #2 Key

1. Array Mystery

```
{2, 5, 10}
{3, 4, 10, 5}
{2, 4, 8, 2, 14}
{4, 5, 12, 9, 15}
{1, 2, 9, 5, 19, 5, 23}
```

2. ArrayList Mystery

```
{-2, -2, 34, 2, 5}
{-34, -34, -34, -34, 12, 34, 65, 1, 4}
{54, -2, -2, -2, -2, 7, 2, 4, 2}
```

3. Complexity

```
n
n
n^2
n log n
```

4. Polymorphism

```
compiler error
Gulp 2/Gulp 3
Gulp 2/Sip 3
Gulp 2/Drink 3
compiler error
Gulp 2/Drink 3
compiler error
Gulp 3
Sip 3
Drink 3
compiler error
Drink 3
runtime error
compiler error
Gulp 2/Bite 3/Gulp 3
Bite 3/Gulp 3
Bite 1
runtime error
Gulp 2/Drink 3
runtime error
```

5. Array Programming

```
public static void reverseFirstK(int[] list, int k) {
    if(k <= list.length && k > 1) {
        for(int i = 0; i < k / 2; i++) {
            int temp = list[i];
            list[i] = list[k - i - 1];
            list[k - i - 1] = temp;
        }
    }
}
```

6. ArrayList Programming

```
public static void kCopies(ArrayList<Integer> list) {
    for (int i = list.size() - 1; i >= 0; i--) {
        int k = list.get(i);
        if (k <= 0) {
            list.remove(i);
        } else {
            for (int j = 0; j < k - 1; j++) {
                list.add(i, k);
            }
        }
    }
}
```

7. Critter Programming

```
public class Grasshopper extends Critter {
    private int max = 0;
    private int move = 0;

    public Direction getMove() {
        if (move == 0) {
            return Direction.CENTER;
        } else if (move <= max) {
            move++;
            return Direction.NORTH;
        } else if (move <= 2 * max) {
            move++;
            return Direction.SOUTH;
        } else {
            move = 0;
            return Direction.WEST;
        }
    }

    public Attack fight(String opponent) {
        if (move == 0) {
            move++;           // idle; wants to fight
            max++;
            return Attack.ROAR;
        }
        return Attack.FORFEIT; // in motion; forfeit
    }
}
```