EvenAndOdds:

This mastery was a lot easier than the ones in chapter 7. I easily learned arrays and was able to know how to use them in this context immediately. Although there were some hiccups, I overcame them quite easily and was able to complete it within the class.

EvenandOdds Code:

```
package Mastery;

public class EvenAndOdds {

    public static void main(String[] args) {
        int[] oddevensort = new int[25];

        int randnum = 0;

        System.out.println("ODD:");
        for(int i = 0; i < oddevensort.length; i++) {
            randnum = (int) (99 * Math.random());
            oddevensort[i] = randnum;
            if (oddevensort[i] % 2 == 1) {
                System.out.print(oddevensort[i] + " ");
            }
        }
        System.out.println("");
        System.out.println("Even:");
        for(int i = 0; i < oddevensort.length; i++) {
            randnum = (int) (99 * Math.random());
            oddevensort[i] = randnum;
            if (oddevensort[i] % 2 == 0) {
                System.out.print(oddevensort[i] + " ");
            }
        }
    }

}
```

EvenandOdds Output:

```
ODD:
83 1 77 95 49 7 9 67 47 71 95 31 61 55
Even:
86 24 52 14 78 54 8 48 36 88 42 42 46 56 80 36
```

Palindrome:

This program seemed simple at first, but I struggled to get the palindrome to work without spaces. Then I discovered the .replaceall function and I was able to make it work. Even with phrases with spaces!

Palindrome Code:

```java
package Mastery;

import java.util.Scanner;

public class Palindrome {

    public static void main(String[] args) {
        Scanner input = new Scanner(System.in);
        System.out.print("Enter a word: ");
        String word = input.nextLine();

        int simularity = 0, r = -1;
        boolean space = false;
        word = word.toLowerCase().replaceAll("\\W", "");
        char palindrome[] = new char[word.length()];
        int palinlength = palindrome.length;
        char reversearray[] = new char[word.length()];
        for (int i = palindrome.length - 1; i > -1; i--) {
            space = false;
            r++;
            if (Character.isLetterOrDigit(word.charAt(r))) {
                palindrome[r] = word.charAt(r);
            } else {
                palinlength--;
                space = true;
            }
            if (Character.isLetterOrDigit(word.charAt(i))) {
                reversearray[i] = word.charAt(i);
            }

            if (palindrome[i] == reversearray[r] && space == false) {
                simularity++;
            }
        }
        if (simularity == palinlength) {
            System.out.println("This is a palindrome.");
        } else {
            System.out.println("This is not a palindrome.");
        }
    }

}

```

Palindrome Output:

```
Enter a word: never odd or even
This is a palindrome.
```

CourseGrades:

This was a tough one. I had to get Mr. Abdalla to help me at the start but through some brutal trial and error, I was able to calculate the averages for the tests and the students.

CourseGrades Code:

```java
package Mastery;

public class CourseGrades {

    public static void main(String[] args) {
        GradeBook grades = new GradeBook(12, 5);
        grades.getGrades();

        grades.showGrades();

        grades.studentAvg();

        grades.testAvg();
    }

}
```

GradeBook Code:

```java
package Mastery;

import java.util.Scanner;

public class GradeBook {
    private int[][] grades;

    public GradeBook(int numStudents, int numGrades)
    {

        grades = new int[numStudents][numGrades];
    }

    public void getGrades() {
        Scanner input = new Scanner(System.in);
        int stuGrade;

        for (int stu = 0; stu < grades.length; stu++) {
            for (int grade = 0; grade < grades[0].length; grade++) {
                System.out.print("Enter test score " + (grade + 1) + " for student " + (stu + 1) + ": ");
                stuGrade = input.nextInt();
                grades[stu][grade] = stuGrade;

            }
        }

    }

    public void showGrades() {
        System.out.println("");
        for (int stu = 0; stu < grades.length; stu++) {
            for (int grade = 0; grade < grades[0].length; grade++) {
                System.out.println("Student " + (stu + 1) + " grade on test " + (grade + 1) + " is " + grades[stu][grade]);

            }
        }
    }
    public void studentAvg() {
        int Avggrade = 0, stu, grade;
        System.out.println("");
        for (stu = 0; stu < grades.length; stu++) {
            Avggrade = 0;
            for (grade = 0; grade < grades[0].length; grade++) {
                Avggrade = Avggrade + grades[stu][grade];
            }
            Avggrade = Avggrade / (grades.length + 1);
            System.out.println("Student " + (stu + 1) + " average grade is " + Avggrade);
        }

    }
```

```
51        public void testAvg() {
52            int Avggrade = 0, stu = 0, grade = 0;
53            System.out.println("");
54            for (grade = 0; grade < grades[0].length; grade++) {
55                Avggrade = 0;
56                for (stu = 0; stu < grades.length; stu++) {
57                    Avggrade = Avggrade + grades[stu][grade];
58                }
59                Avggrade = Avggrade / (stu);
60                System.out.println("test " + (grade + 1) + " average grade is " + Avggrade);
61            }
62
63        }
64
65    }
66
```

CourseGrades Output:

```
Enter test score 1 for student 1: 23
Enter test score 2 for student 1: 34
Enter test score 3 for student 1: 45
Enter test score 1 for student 2: 56
Enter test score 2 for student 2: 67
Enter test score 3 for student 2: 87

Student 1 grade on test 1 is 23
Student 1 grade on test 2 is 34
Student 1 grade on test 3 is 45
Student 2 grade on test 1 is 56
Student 2 grade on test 2 is 67
Student 2 grade on test 3 is 87

Student 1 average grade is 34
Student 2 average grade is 70

test 1 average grade is 39
test 2 average grade is 50
test 3 average grade is 66
```