Project4_1:

```java
import java.util.*;
public class Project4_4 {
        public static void main(String[] args){
                int[] testVals = {89, 95, 72, 83, 99, 54, 86, 75, 92, 73, 79, 75, 82, 83, 73};
                double avg = calcAverage(testVals);
                System.out.printf("The average of testVals is %.2f %n" , avg);

                double variance = variance(avg, testVals);
                System.out.printf("The variance of testVals is %.2f" , variance);
        }
        static double calcAverage(int[] testVals){
                double sum=0;
                for(int i = 0; i<testVals.length; i++){
                        sum += testVals[i];
                }
                return sum/testVals.length;
        }

        static double variance(double avg, int[] testVals){
                double variance = 0;
                double squares = 0.0;
                for(int i = 0; i < testVals.length; i++){
                        squares += Math.pow(testVals[i]-avg, 2);
                }
                return squares/testVals.length;
        }
}


/*********output**********
The average of testVals is 80.67
The variance of testVals is 116.76
*/
```

Project4_2:
```java
import java.util.*;
import java.lang.*;
public class Project4_2 {
        public static void main(String[] args){
                String[] Fortune = {"Study more", "Go to movie", "Relax", "Sleep"};
                int i = 0;
                do{
                        //System.out.print(Math.random());
                        i = (int)(Math.random() * 4); // 0-3
                        System.out.println(Fortune[i]);
                }while(i!= 3);
```

```
        }
}


/*********output**********
Relax
Relax
Relax
Study more
Sleep
*/

Project4_3:

import java.util.*;
public class Project4_3 {
        public static void main(String[] args){
                Scanner read = new Scanner(System.in);
                int[] a = new int[7];
                System.out.print("Enter 7 int number: ");
                for(int i = 0; i< a.length; i++){
                        a[i] = read.nextInt();
                }
                System.out.print("Original data: ");
                Display(a);
                java.util.Arrays.sort(a);
                System.out.print("Sorted data: ");
                Display(a);

                System.out.print("Enter an int number: ");
                int bs = read.nextInt();
                int index_bs = java.util.Arrays.binarySearch(a, bs);
                System.out.println(bs + " is at location " + index_bs + " of the sorted array");

        }

        static void Display(int[] a){
                for(int i = 0; i< a.length; i++){
                        System.out.printf("%4d",a[i]);
                }
                System.out.println();
        }
}

/*********output**********
Enter 7 int number: 10 15 40 70 30 9 11
Original data:   10  15  40  70  30   9  11
Sorted data:    9  10  11  15  30  40  70
```

Enter an int number: 11
11 is at location 2 of the sorted array
*/

Project4_4:
```java
import java.util.*;
public class Project4_4 {
        public static void main(String[] args){
                int[] testVals = {89, 95, 72, 83, 99, 54, 86, 75, 92, 73, 79, 75, 82, 83, 73};
                double avg = calcAverage(testVals);
                System.out.printf("The average of testVals is %.2f %n" , avg);

                double variance = variance(avg, testVals);
                System.out.printf("The variance of testVals is %.2f" , variance);
        }
        static double calcAverage(int[] testVals){
                double sum=0;
                for(int i = 0; i<testVals.length; i++){
                        sum += testVals[i];
                }
                return sum/testVals.length;
        }

        static double variance(double avg, int[] testVals){
                double variance = 0;
                double squares = 0.0;
                for(int i = 0; i < testVals.length; i++){
                        squares += Math.pow(testVals[i]-avg, 2);
                }
                return squares/testVals.length;
        }
}
```


/*********output**********
The average of testVals is 80.67
The variance of testVals is 116.76
*/