1.

```
import java.util.Scanner;

public class Main {

     public static void main(String[] args) {

        final int NUM_INT = 10;

        Scanner in = new Scanner(System.in);
        System.out.println("Please input " + NUM_INT + " integers: ");

        int[] numbers = new int[NUM_INT];
        int pos = 0;
        while (pos < NUM_INT && in.hasNextInt()) {
            numbers[pos] = in.nextInt();
            pos++;
        }

        printNumsAtEvenPositions(numbers);
        printEvenNums(numbers);
        printNumsInReverseOrder(numbers);
    }

    /**
     * Prints the numbers at even positions of an array of integers
     * @param nums the array of integers
     */
    public static void printNumsAtEvenPositions(int[] nums) {
        for (int i=0; i < nums.length; i=i+2) {
            System.out.print(nums[i] + " ");
        }
        System.out.println();
    }

    /**
     * Prints the even numbers in an array of integers
     * @param nums the array of integers
     */
    public static void printEvenNums(int[] nums) {
        for (int i=0; i < nums.length; i++) {
            if (nums[i] % 2 == 0) {
                System.out.print(nums[i] + " ");
            }
        }
        System.out.println();
    }

    /**
     * Prints an array of integers in reverse
     * @param nums the array of integers
     */
    public static void printNumsInReverseOrder(int[] nums) {
        for (int i=nums.length-1; i >= 0; i--) {
            System.out.print(nums[i] + " ");
        }
        System.out.println();
    }
}
```

2.

```
import java.util.Scanner;

public class Main {


    public static void main(String[] args) {

        final int MAX_SIZE = 100;

        Scanner in = new Scanner(System.in);
        System.out.println("Please input a sequence of numbers, type Q to
end: ");

        int pos = 0;
        double[] numbers = new double[MAX_SIZE];
        while (in.hasNextDouble() && pos < MAX_SIZE) {
            numbers[pos] = in.nextDouble();
            pos++;
        }

        System.out.println("Their alternating sum is " +
alternatingSum(numbers));

    }

    /**
     * Computes and returns the alternating sum of an
     * array of floating-point numbers
     * @param nums the array of floating-point numbers
     * @return the alternating sum of the numbers
     */
    public static double alternatingSum(double[] nums) {
        double sum = 0;
        for (int i = 0; i < nums.length; i++) {
            if (i % 2 == 0) {
                sum = sum + nums[i];
            }
            else {
                sum = sum - nums[i];
            }
        }
        return sum;
    }

}
```

3.

```
import java.util.Scanner;
```

```
public class Main {


    public static void main(String[] args) {

        final int MAX_SIZE = 100;

        Scanner in = new Scanner(System.in);
        System.out.println("Please input a sequence of numbers, type Q to
end: ");

        int size = 0;
        double[] numbers = new double[MAX_SIZE];
        while (in.hasNextDouble() && size < MAX_SIZE) {
            numbers[size] = in.nextDouble();
            size++;
        }

        double[] reversed = reverseArray(numbers,size);

        System.out.print("Their reverse is ");
        for (int i = 0; i < size; i++) {
            System.out.print(reversed[i] + " ");
        }

    }

    /**
     * Takes a possibly partially filled array of floating-point numbers
     * and returns an array with the same numbers in reverse
     * @param nums the array of floating-point numbers
     * @param size the number of entries that have been filled
     * @return the reverse array, with the same number of filled entries
     */
    public static double[] reverseArray(double[] nums, int size) {
        double [] reversed = new double[size];
        for (int i = size - 1; i >= 0; i--) {
            reversed[size - i - 1] = nums [i];
        }
        return reversed;
    }

}
```

4.

```
import java.util.Scanner;
import java.util.ArrayList;

public class Main {


    public static void main(String[] args) {

        Scanner in = new Scanner(System.in);
        System.out.println("Please input a sequence of numbers, type Q to
end: ");

        ArrayList<Double> numbers = new ArrayList<Double>();
        while (in.hasNextDouble()) {
            numbers.add(in.nextDouble());
        }

        System.out.println("Their alternating sum is " +
alternatingSum(numbers));

    }

    /**
     * Computes and returns the alternating sum of an array list of
     * floating-point numbers
     * @param nums the array list of floating-point numbers
     * @return the alternating sum of the numbers
     */
    public static double alternatingSum(ArrayList<Double> nums) {
        double sum = 0;
        for (int i = 0; i < nums.size(); i++) {
            if (i % 2 == 0) {
                sum = sum + nums.get(i);
            }
            else {
                sum = sum - nums.get(i);
            }
        }
        return sum;
    }


}
```

5.

```
import java.util.Scanner;
import java.util.ArrayList;

public class Main {


    public static void main(String[] args) {


        Scanner in = new Scanner(System.in);
        System.out.println("Please input a sequence of numbers, type Q to
end: ");

        ArrayList<Double> numbers = new ArrayList<Double>();
        while (in.hasNextDouble()) {
            numbers.add(in.nextDouble());
        }

        ArrayList<Double> reversed = reverseArray(numbers);
        System.out.print("Their reverse is ");
        for (int i = 0; i < reversed.size(); i++) {
            System.out.print(reversed.get(i) + " ");
        }

    }

    /**
     * Takes an array list of floating-point numbers and returns an array
list
     * with the same numbers in reverse
     * @param nums the array list of numbers
     * @return the reversed array list
     */
    public static ArrayList<Double> reverseArray(ArrayList<Double> nums)
{
        ArrayList<Double> reversed = new ArrayList<Double>();
        for (int i = nums.size() - 1; i >= 0; i--) {
            reversed.add(nums.get(i));
        }
        return reversed;
    }

}
```

6.

```
import java.util.Scanner;
import java.util.ArrayList;

public class Main {


    public static void main(String[] args) {


        Scanner in = new Scanner(System.in);
        System.out.println("Please input a sequence of numbers, type Q to
end: ");

        ArrayList<Double> numbers = new ArrayList<Double>();
        while (in.hasNextDouble()) {
            numbers.add(in.nextDouble());
        }

        ArrayList<Double> noDuplicates = removeDuplicates(numbers);

        System.out.print("The numbers with duplicates removed are ");
        for (int i = 0; i < noDuplicates.size(); i++) {
            System.out.print(noDuplicates.get(i) + " ");
        }

    }

    /**
     * Takes an array list of numbers and returns an array list with the
same
```

```
     * numbers but with any duplicates removed
     * @param nums the array list of numbers
     * @return the array list with duplicates removed
     */
    public static ArrayList<Double> removeDuplicates(ArrayList<Double>
nums) {
        ArrayList<Double> noDups = new ArrayList<Double>(nums);

        int currentSize = noDups.size();
        int currentPos = 0;
        while (currentPos < currentSize) {
            int examinePos = currentPos+1;
            while (examinePos < currentSize) {
                if
(noDups.get(currentPos).equals(noDups.get(examinePos))) {
                    noDups.remove(examinePos);
                    currentSize--;
                }
                else {
                    examinePos++;
                }
            }
            currentPos++;
        }

        return noDups;
    }

}
```