Session 06

Numbers, Arrays and Strings

A. STEPS BY STEPS

I. Arrays

Write a program to get a list of integers from the user and stored in array.

- Print array.
- Print the array in descending order.
- Print the number divisible by 5 in the array.
- Enter an integer, said several times that number appeared in the array.

Example

```
run:
Please enter number of elements: 10
Enter 1's number: 2
Enter 2's number: 9
Enter 3's number: 5
Enter 4's number: 4
Enter 5's number: 15
Enter 6's number: 2
Enter 7's number: 10
Enter 8's number: 2
Enter 9's number: -5
Enter 10's number: 7
-----------------------

Array has been entered:
2 9 5 4 15 2 10 2 -5 7
-----------------------
Array in descending order:
15 10 9 7 5 4 2 2 2 -5
-----------------------
All elements that are divisible by 5:
15 10 5 -5
-----------------------
Enter an value that you want to found: 2
There are 3 elements which value is 2
BUILD SUCCESSFUL (total time: 35 seconds)
```

Code

```
package Session06;
import java.util.Scanner;

public class Array01 {
    public static void main(String args[]) {
        int length;
        Scanner input = new Scanner(System.in);

        //Requires users to enter the number of elements
        System.out.print("Please enter number of elements: ");
        length = input.nextInt();

        //Create new array base on the number of elements
        int[] arrayA = new int[length];

        //Requires user to enter each item of array
        for (int i = 0; i <= length - 1; i++) {
            System.out.print("Enter " + (i + 1) + "'s number: ");
            arrayA[i] = input.nextInt();
        }

        //Shows array values
        System.out.println("---------------------- ");
        System.out.println("\nArray has been entered: ");
        for (int i = 0; i <= length - 1; i++) {
            System.out.print(arrayA[i] + " ");
        }

        //Use the Bubble Sort algorithm to get the descending array
        for (int i = 0; i <= arrayA.length - 2; i++) {
            for (int j = i + 1; j <= arrayA.length - 1; j++) {
                if (arrayA[i] < arrayA[j]) {
                    int tmp = arrayA[i];
                    arrayA[i] = arrayA[j];
                    arrayA[j] = tmp;
                }
            }
        }

        //Shows descending array
        System.out.println("\n---------------------- ");
        System.out.println("Array in descending order: ");
        for (int i = 0; i <= length - 1; i++) {
            System.out.print(arrayA[i] + " ");
        }

        //Show all elements that are divisible by 5
        System.out.println("\n---------------------- ");
        System.out.println("All elements that are divisible by 5: ");
        for (int i = 0; i <= arrayA.length - 1; i++) {
            if (arrayA[i] % 5 == 0) {
                System.out.print(arrayA[i] + " ");
            }
        }
```

```
        //Find the number of occurrences of a specific value in the array
        System.out.println("\n---------------------- ");
        System.out.print("Enter an value that you want to find: ");
        int value = input.nextInt();
        int count = 0;
        for (int i = 0; i <= arrayA.length - 1; i++) {
            if (arrayA[i] == value) {
                count++;
            }
        }
        if (count == 0) {
            System.out.println("The value " + value + " is not found");
        } else if (count == 1) {
            System.out.println("There are " + count +
                               " element which value is " + value);
        } else {
            System.out.println("There are " + count +
                               " elements which value is " + value);
        }
    }
}
```

II. String

Write a program to get into an string from the user:

- Print string.
- Print the number of alphabetic characters in string.
- the number of alphanumeric characters in string.
- Enter a string, said from which the chain? If yes please indicate position.
- Print string in reverse sequence.

Example

```
run:
Please enter any text: PRO192 - Object Oriented Programming
Your text is: PRO192 - Object Oriented Programming
Number of character of your text: 36
Number of alphabet of the text: 28
Number of digit of the text: 3
Enter the term that you want to find:
O
The term 'O' is found at index [2] in your text
The reverse text is: gnimmargorP detneirO tcejbO - 291ORP
The reverse text (word reverse): Programming Oriented Object - PRO192
BUILD SUCCESSFUL (total time: 29 seconds)
```

Code

```
package Session06;
import java.util.Scanner;

public class String01 {
    public static void main(String args[]) {
        String myString;

        //Requires user to enter any text
        Scanner input = new Scanner(System.in);
        System.out.print("Please enter any text: ");
        myString = input.nextLine();

        //Shows the inputted text
        System.out.println("Your text is: " + myString);

        //Count number of character of this text
        System.out.println("Number of character of your text: " +
                           myString.length());

        //Counts number of alphabet of the text
        int countAlphabet = 0;
        for (int i = 0; i <= myString.length() - 1; i++) {
            if (myString.charAt(i) >= 65 && myString.charAt(i) <= 122) {
                countAlphabet++;
            }
        }

        System.out.println("Number of alphabet of the text: " +
                           countAlphabet);

        //Count number of digit of the text
        int countDigit = 0;
        for (int i = 0; i <= myString.length() - 1; i++) {
            if (myString.charAt(i) >= 48 && myString.charAt(i) <= 57) {
                countDigit++;
            }
        }
        System.out.println("Number of digit of the text: " + countDigit);

        //Found substring
        String keyword;
        System.out.println("Enter the term that you want to find: ");
        keyword = input.nextLine();
```

```
        int index = myString.indexOf(keyword);
        if (index != -1) {
            System.out.println("The term '" + keyword +
                        "' is found at index [" + index + "] in your text");
        } else {
            System.out.println("The term '" + keyword +
                        "' is not found in your text");
        }

        //Use StringBuilder to reverse the text
        StringBuilder objStrBuilder = new StringBuilder(myString);
        System.out.println("The reverse text is: " +
                           objStrBuilder.reverse());

        //Reverse word of the text
        String[] resources = myString.split("\\s+");
        String myReverseString = resources[resources.length-1];
        for (int i = resources.length-2; i >= 0; i--) {
            myReverseString += " " + resources[i];
        }
        System.out.println("The reverse text (word reverse): " +
                           myReverseString);
    }
}
```

B. MORE EXCERCISES

1. Write a program management students a list of names (up to 20 names). The program features:
   - Add a new name
   - Search names by keyword
   - Displays a list of names
   - Exit program

```
STUDENT NAMES MANAGER
   1. Add a name
   2. Show names list
   3. Search for name
   4. Exit
Please enter your choice:
```

Add a name:

```
- Please enter name: Maria
*** Name added! ***
```

Show names list:

```
* Names list:
- Maria
- James
- Jack
```

Search for name:

```
- Please enter keyword: Ja
- Search results:
   + James
   + Jack
```

2. Create MyTools class with below tasks:
   - Create an **instance variable** that is an array of integers
   - Create a **constructor** to initialize array, elements of array, values of n elements of array, n is get from the keyboard
   - **int getMax()** method to return the maximum value of array
   - **void sort()** method to sort array in ascending if it isn't sorted
   - **boolean isSort()** method to check the array whether is sorted ascending or not
   - **void display()** method to display all elements of array
   - In **main method**, create an object of this class and call the above methods