May 19th, 2020

Exercises for Programming Practice 2

Today's topic is array-based sequences. It is convenient to use "ArrayList" to handle dynamic arrays in Java. The "ArrayList" and "Iterator" that is useful for handling array are described in the document "ArrayList&Iterator".

After understanding this document, please challenge "Exercise 1" and "Exercise 2". The String array "colorData" is used in the two execrcises. This data can be obtained from "colorData.txt" of "Week3" of Resources page, "Programming Practice 2" course, manaba+R.

> Note:
> - ✓ Do not create "module-info.java", when you create a Java Project.
> - ✓ Do not set Package name in the window "New Java Class".
> - ✓ Do not use the title of exercise for "contents of the program". Think about "contents of the program" yourself.

The deadline for submitting the programs is 18:00 on May 21st, 2020.

Exercise 1 (file name "Exercise1.java")

Create a Java program named "Exercise1.java" to output the position of word blue, green, red and yellow in array colorData.

Make method "public void showPosition(String *color*)" that outputs *color* and the position of *color* in ArrayList colors. The color positions start from 0.

Tips:

- ✓ Use "equals" method to check if the String data are the same.
- ✓ It is easy to understand by inserting a blank after outputting the position.
- ✓ Put a print statement indicating a line break at the end of the output for each color.

The outline of the program is shown in Fig. 1, and the expected output is shown in Fig. 2. ArrayList "colors" are created from String array "colorData" in the constructor.

```java
/* comments */
import java.util.ArrayList;

public class Exercise1 {
    String[] colorData = {"yellow", "blue", "red", "yellow", "green",
        "red", "yellow", "red", "green", "blue", "blue", "yellow", "blue",
        "red", "green", "red", "yellow", "blue", "green", "red", "yellow",
        "blue", "red", "green", "yellow", "green", "yellow", "red"};

    ArrayList<String> colors = new ArrayList<String>();

    public static void main(String[] args) {
        Exercise1 ex1 = new Exercise1();
    }

    public Exercise1() {
        for(int i = 0; i < colorData.length; i++) {
            colors.add(colorData[i]);
        }
        showPosition("blue");
        showPosition("green");
        showPosition("red");
        showPosition("yellow");
    }

    public void showPosition(String color) {

        // Complete this part

    }
}
```

Fig. 1 The outline of the program “Exercise1.java”

```
blue is at 1 9 10 12 17 21
green is at 4 8 14 18 23 25
red is at 2 5 7 13 15 19 22 27
yellow is at 0 3 6 11 16 20 24 26
```

Fig. 2 The expected output of “Exercise1.java”

Exercise 2 (file name “Exercise2.java”)

Develop “Exercise1.java” to create a Java program named “Exercise2.java” to remove all words “green” from ArrayList “colors”.

Make method “public void deleteColor(String *color*)” to remove the words *color* from ArrayList “colors”. Use “Iterator”.

The outline of the program is shown in Fig. 3, and the expected output is shown in Fig. 4.

```
/* comments */
import java.util.ArrayList;
import java.util.Iterator;

public class Exercise2 {
    String[] colorData = {"yellow", "blue", "red", "yellow", "green",
            "red", "yellow", "red", "green", "blue", "blue", "yellow", "blue",
            "red", "green", "red", "yellow", "blue", "green", "red", "yellow",
            "blue", "red", "green", "yellow", "green", "yellow", "red"};

    ArrayList<String> colors = new ArrayList<String>();

    public static void main(String[] args) {
        Exercise2 ex2 = new Exercise2();
    }

    public Exercise2() {
        for(int i = 0; i < colorData.length; i++) {
            colors.add(colorData[i]);
        }
        showPosition("blue");
        showPosition("green");
        showPosition("red");
        showPosition("yellow");
        deleteColor("green");
        showPosition("blue");
        showPosition("green");
        showPosition("red");
        showPosition("yellow");
    }

    public void deleteColor(String color) {
        // Complete this part
        System.out.println(color + " was deleted from colors");
    }

    public void showPosition(String color) {
        // Complete this part
    }
}
```

Fig. 3 The outline of the program “Exercise2.java”

```
blue is at 1 9 10 12 17 21
green is at 4 8 14 18 23 25
red is at 2 5 7 13 15 19 22 27
yellow is at 0 3 6 11 16 20 24 26
green was deleted from colors
blue is at 1 7 8 10 14 17
green is at
red is at 2 4 6 11 12 15 18 21
yellow is at 0 3 5 9 13 16 19 20
```

Fig. 4 The expected output of “Exercise1.java”