

# ASSIGNMENT DAY 3

## QUESTION 1

```
import java.awt.Color;

import java.awt.Font;

import java.awt.Graphics;

import javax.swing.JFrame;

import javax.swing.JPanel;


public class ColorChangingText extends JPanel implements Runnable {

    private static final long serialVersionUID = 1L;

    private int x = 20, y = 50;

    private Color color = Color.BLACK;

    private String text = "Hello, world!";

    private Font font = new Font("Arial", Font.BOLD, 20);


    public void run() {

        while (true) {

            try {

                Thread.sleep(1000);

            } catch (InterruptedException e) {

                e.printStackTrace();

            }

            color = getNextColor();

            repaint();

        }

    }


    private Color getNextColor() {

        int r = color.getRed();
```

```

int g = color.getGreen();

int b = color.getBlue();

if (r == 255 && g < 255 && b == 0) {
    g++;
} else if (r > 0 && g == 255 && b == 0) {
    r--;
} else if (r == 0 && g == 255 && b < 255) {
    b++;
} else if (r == 0 && g > 0 && b == 255) {
    g--;
} else if (r < 255 && g == 0 && b == 255) {
    r++;
} else if (r == 255 && g == 0 && b > 0) {
    b--;
}

return new Color(r, g, b);
}

```

```

protected void paintComponent(Graphics g) {
    super.paintComponent(g);
    g.setFont(font);
    g.setColor(color);
    g.drawString(text, x, y);
}

```

```

public static void main(String[] args) {
    JFrame frame = new JFrame("Color Changing Text");
    frame.setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);
    ColorChangingText panel = new ColorChangingText();
}

```

```

frame.add(panel);

frame.setBounds(100, 100, 400, 200);

frame.setVisible(true);

Thread thread = new Thread(panel);

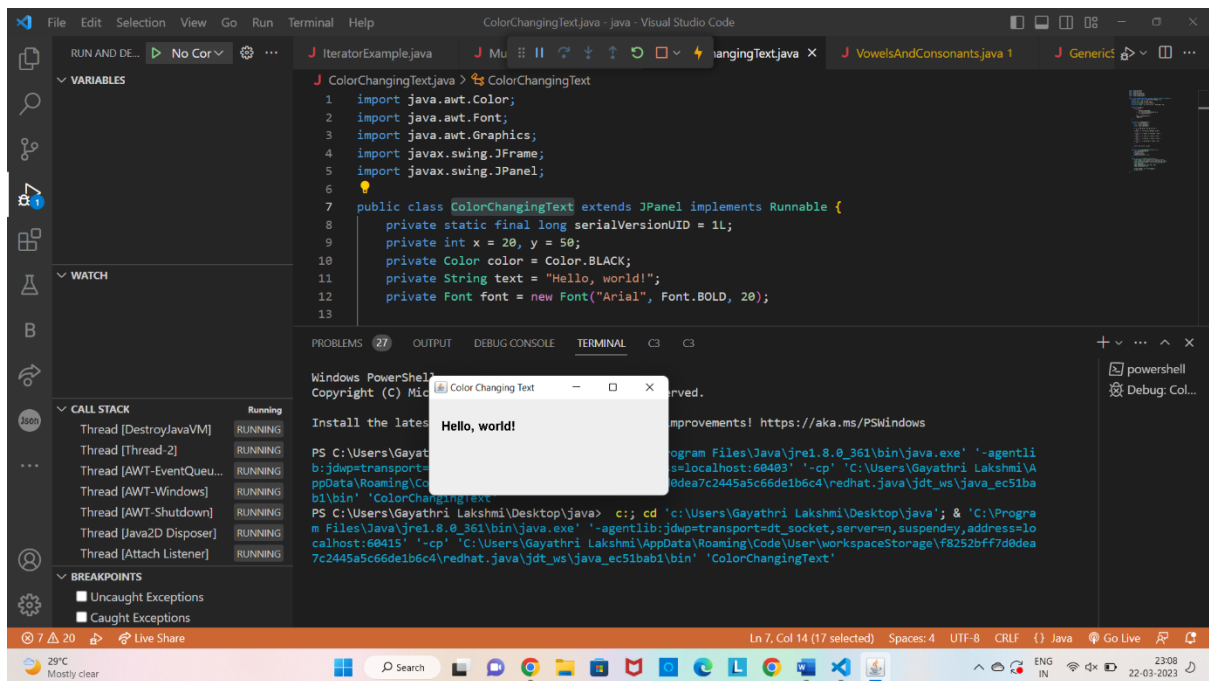
thread.start();

}

}

```

OUTPUT:



QUESTION 2:

```

public class MultiplicationTable implements Runnable {

    private int table;

    public MultiplicationTable(int table) {

```

```
        this.table = table;
    }

    public void run() {
        System.out.println("Multiplication table of " + table + ":");

        for (int i = 1; i <= 10; i++) {
            System.out.printf("%d x %d = %d\n", table, i, table * i);
        }
    }
}
```

```
public static void main(String[] args) {
    MultiplicationTable table5 = new MultiplicationTable(5);
    MultiplicationTable table10 = new MultiplicationTable(10);

    Thread t1 = new Thread(table5);
    Thread t2 = new Thread(table10);

    t1.start();

    try {
        t1.join();
    } catch (InterruptedException e) {
        e.printStackTrace();
    }

    t2.start();

    try {
        t2.join();
    } catch (InterruptedException e) {
```

```

        e.printStackTrace();
    }
}
}

```

OUTPUT:

```

File Edit Selection View Go Run Terminal Help
MultiplicationTable.java - java - Visual Studio Code

EXPLORER
  JAVA
    cmp number.java
    ColorChangingText.java
    composite.java
    countvowels.java
    CylinderVolumeSurfaceArea.java
    ExDemo.java
    GenericSwap.java
    IteratorExample.java
    MatrixMultiplication.java
    matrixsum.java
    MultiplicationTable.java
    ReverseWord.java
    sample.java
    Solution.java
    SortNames.java
    splchara.java
    string to integer.java
    sum.java
    superDemo.java
    user.java
    usevalid or not.java
    VowelsAndConsonants.java
    Year.java
  OUTLINE
  TIMELINE
  JAVA PROJECTS

PROBLEMS (27) OUTPUT DEBUG CONSOLE TERMINAL
Multiplication table of 5:
5 x 1 = 5
5 x 2 = 10
5 x 3 = 15
5 x 4 = 20
5 x 5 = 25
5 x 6 = 30
5 x 7 = 35
5 x 8 = 40
5 x 9 = 45
5 x 10 = 50
Multiplication table of 10:
10 x 1 = 10
10 x 2 = 20
10 x 3 = 30
10 x 4 = 40
10 x 5 = 50
10 x 6 = 60
10 x 7 = 70
10 x 8 = 80
10 x 9 = 90
10 x 10 = 100
PS C:\Users\Gayathri Lakshmi\Desktop\java>

Ln 9, Col 50 Spaces: 4 UTF-8 CRLF {} Java Go Live
23:14 22-03-2023

```

QUESTION 3:

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

```
import java.util.List;
```

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

```
public class PrimeFactors {
```

```
    public static boolean isUgly(int n) {
```

```
        if (n <= 0) {
```

```
            return false;
```

```
        }
```

```

    if (n == 1) {
        return true;
    }

    List<Integer> primeFactors = new ArrayList<>();

    while (n % 2 == 0) {
        primeFactors.add(2);
        n /= 2;
    }

    while (n % 3 == 0) {
        primeFactors.add(3);
        n /= 3;
    }

    while (n % 5 == 0) {
        primeFactors.add(5);
        n /= 5;
    }

    return n == 1;
}

public static void main(String[] args) {
    Scanner scanner = new Scanner(System.in);
    System.out.print("N= ");
    int n = scanner.nextInt();

    boolean isUgly = isUgly(n);

```

```

System.out.println("Output: " + isUgly);

if (isUgly) {
    System.out.println("Explanation: " + n + " has only prime factors limited to 2, 3, and 5.");
} else {
    System.out.println("Explanation: " + n + " has prime factors other than 2, 3, and 5.");
}
}
}

```

OUTPUT:

The screenshot shows the Visual Studio Code interface with the PrimeFactors.java file open. The code in the editor is as follows:

```

21 while (n % 3 == 0) {
22     primeFactors.add(3);
23     n /= 3;
24 }
25
26 while (n % 5 == 0) {
27     primeFactors.add(5);
28     n /= 5;
29 }
30
31 return n == 1;
32 }
33
34
35 public static void main(String[] args) {
36     Scanner scanner = new Scanner(System.in);
37     System.out.print("N= ");
38     int n = scanner.nextInt();

```

The terminal output shows the execution of the program:

```

s:\Java\jre1.8.0_361\bin\java.exe' '-agentlib:jdwp=transport=dt_socket,server=n,suspend=y,address=localhost:6069
7' '-cp' 'C:\Users\Gayathri Lakshmi\AppData\Roaming\Code\User\workspaceStorage\F8252bfff7d0dea7c2445a5c66de1b6c4
\redhat.java\jdt_ws\java_ec51bab1\bin' 'PrimeFactors'
N= 1
Output: true
Explanation: 1 has only prime factors limited to 2, 3, and 5.
PS C:\Users\Gayathri Lakshmi\Desktop\java>

```

QUESTION 4:

```

import java.util.Scanner;

public class Fibonacci {

    public static int fib(int n) {

        if (n == 0) {

            return 0;

        } else if (n == 1) {

```

```

        return 1;
    } else {
        return fib(n - 1) + fib(n - 2);
    }
}

public static void main(String[] args) {
    Scanner scanner = new Scanner(System.in);

    System.out.print("N= ");

    int n = scanner.nextInt();

    int fibonacciNumber = fib(n);

    System.out.println("Output: " + fibonacciNumber);

    System.out.println("Explanation: F(" + n + ") = F(" + (n-1) + ") + F(" + (n-2) + ") = " + fib(n-1) + " + "
+ fib(n-2) + " = " + fibonacciNumber + ".");
}
}

```

OUTPUT:

The screenshot shows the Visual Studio Code interface. The Explorer pane on the left lists files in a project named 'java'. The main editor window shows the 'Fibonacci.java' file with the following code:

```

11     }
12 }
13
14 public static void main(String[] args) {
15     Scanner scanner = new Scanner(System.in);
16     System.out.print("N= ");
17     int n = scanner.nextInt();
18
19     int fibonacciNumber = fib(n);
20
21     System.out.println("Output: " + fibonacciNumber);
22     System.out.println("Explanation: F(" + n + ") = F(" + (n-1) + ") + F(" + (n-2) + ") = " + fib(n-1)
23 + fib(n-2) + " = " + fibonacciNumber + ".");
24 }
25

```

The bottom panel shows the 'TERMINAL' tab with the following output:

```

N= 2
Output: 1
Explanation: F(2) = F(1) + F(0) = 1 + 0 = 1.
PS C:\Users\Gayathri Lakshmi\Desktop\java>

```

The status bar at the bottom indicates 'Ln 16, Col 29', 'Spaces: 4', 'UTF-8', 'CRLF', and 'Java'.

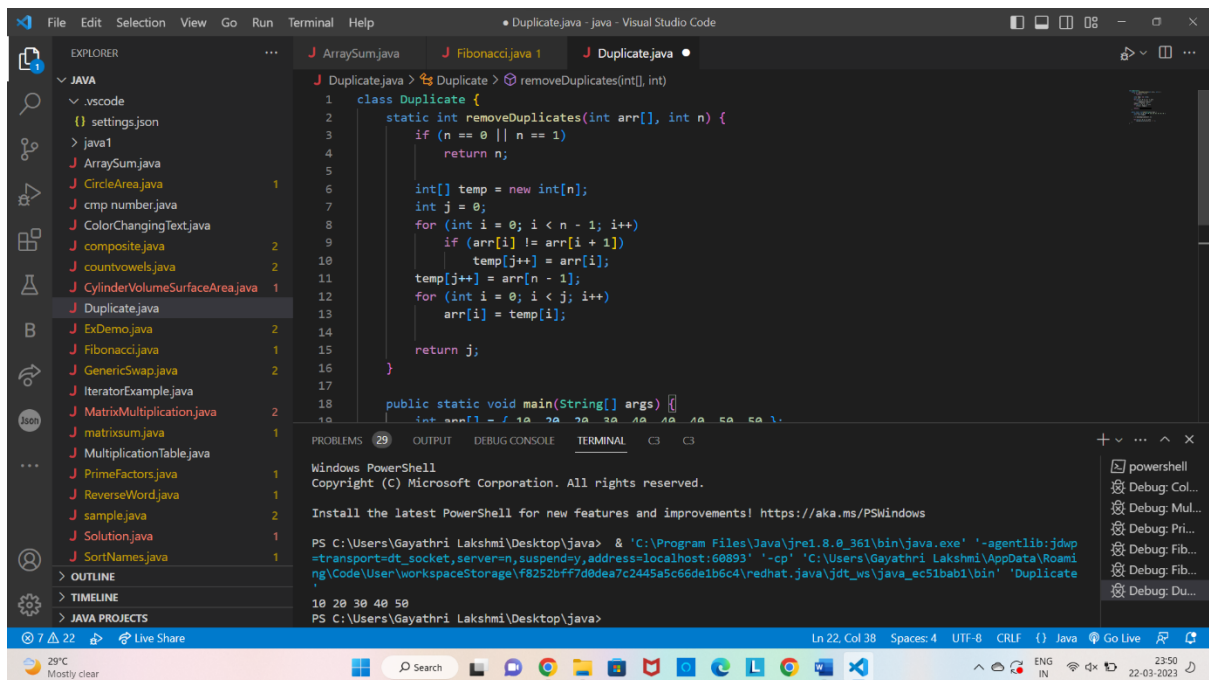


ERROR CORRECTION:

QUESTION 5

```
class Duplicate {  
  
    static int removeDuplicates(int arr[], int n) {  
  
        if (n == 0 || n == 1)  
            return n;  
  
        int[] temp = new int[n];  
        int j = 0;  
        for (int i = 0; i < n - 1; i++)  
            if (arr[i] != arr[i + 1])  
                temp[j++] = arr[i];  
        temp[j++] = arr[n - 1];  
        for (int i = 0; i < j; i++)  
            arr[i] = temp[i];  
  
        return j;  
    }  
  
    public static void main(String[] args) {  
        int arr[] = { 10, 20, 20, 30, 40, 40, 40, 50, 50 };  
        int n = arr.length;  
  
        n = removeDuplicates(arr, n);  
  
        for (int i = 0; i < n; i++)  
            System.out.print(arr[i] + " ");  
    }  
}
```

OUTPUT:



The screenshot shows the Visual Studio Code interface with a Java project. The Explorer panel on the left lists various Java files, including 'Duplicate.java'. The main editor displays the code for 'Duplicate.java', which includes a 'removeDuplicates' method and a 'main' method. The terminal at the bottom shows the command to run the program, and the output displays the array after removing duplicates.

```
class Duplicate {
    static int removeDuplicates(int arr[], int n) {
        if (n == 0 || n == 1)
            return n;

        int[] temp = new int[n];
        int j = 0;
        for (int i = 0; i < n - 1; i++)
            if (arr[i] != arr[i + 1])
                temp[j++] = arr[i];
        temp[j++] = arr[n - 1];
        for (int i = 0; i < j; i++)
            arr[i] = temp[i];

        return j;
    }

    public static void main(String[] args) {
        int arr[] = { 10, 20, 30, 30, 40, 40, 40, 50, 50 };
    }
}
```

Terminal Output:

```
PS C:\Users\Gayathri Lakshmi\Desktop\java> & 'C:\Program Files\Java\jre1.8.0_361\bin\java.exe' '-agentlib:jdwp
=transport=dt_socket,server=n,suspend=y,address=localhost:60893' '-cp' 'C:\Users\Gayathri Lakshmi\AppData\Roami
ng\Code\User\workspaceStorage\f8252bff7d8dea7c2445a5c66de1b6c4\redhat.java\jdt_ws\java_ec51bab1\bin' 'Duplicate
'
10 20 30 40 50
PS C:\Users\Gayathri Lakshmi\Desktop\java>
```