LAB - 11

Java Programming Lab

Topics Covered

Swings

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4C7

EXPERIMENT – 11.1

Aim:

Create runnable jar file in java.

Theory:

Java swing : Java Swing tutorial is a part of Java Foundation Classes (JFC) that is used to create window-based applications. It is built on the top of AWT (Abstract Windowing Toolkit) API and entirely written in java.Unlike AWT, Java Swing provides platform-independent and lightweight components. The javax.swing package provides classes for java swing API such as JButton, JTextField, JTextArea, JRadioButton, JCheckbox, JMenu, JColorChooser etc.

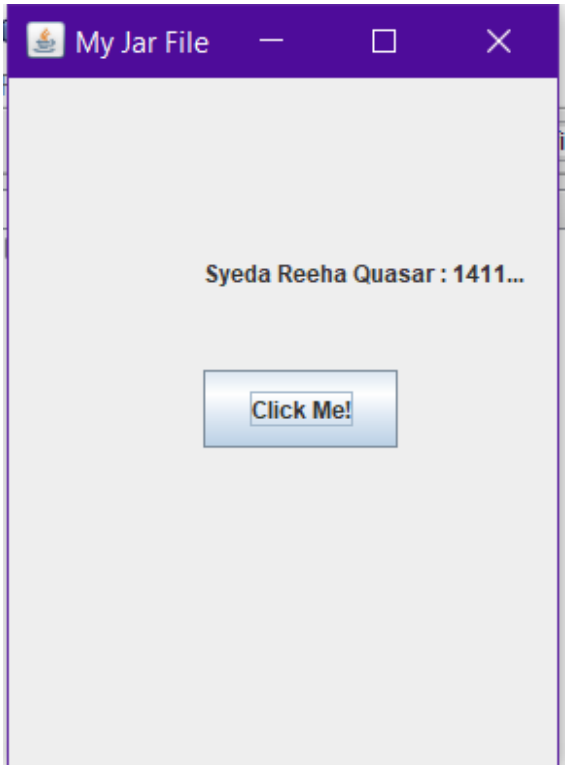
JFrame : The javax.swing.JFrame class is a type of container which inherits the java.awt.Frame class. JFrame works like the main window where components like labels, buttons, textfields are added to create a GUI. Unlike Frame, JFrame has the option to hide or close the window with the help of setDefaultCloseOperation(int) method.

Source Code:

```
import javax.swing.*;


public class IOFile {
    IOFile() {
        JFrame f = new JFrame("My Jar File");


        JButton b = new JButton("Click Me!");
        b.setBounds(100, 150, 100, 40);
        JLabel l1 = new JLabel("Syeda Reeha Quasar : 14114802719");
        l1.setBounds(100, 50, 170, 100);
```

```
        f.add(b);
        f.add(l1);
        f.setSize(300, 400);
        f.setLayout(null);
        f.setVisible(true);

        f.setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);
    }

    public static void main(String[] args) {
        new IOFile();
    }
}
```

Output:



EXPERIMENT – 11.2

Aim:

Display image on a button in swing.

Theory:

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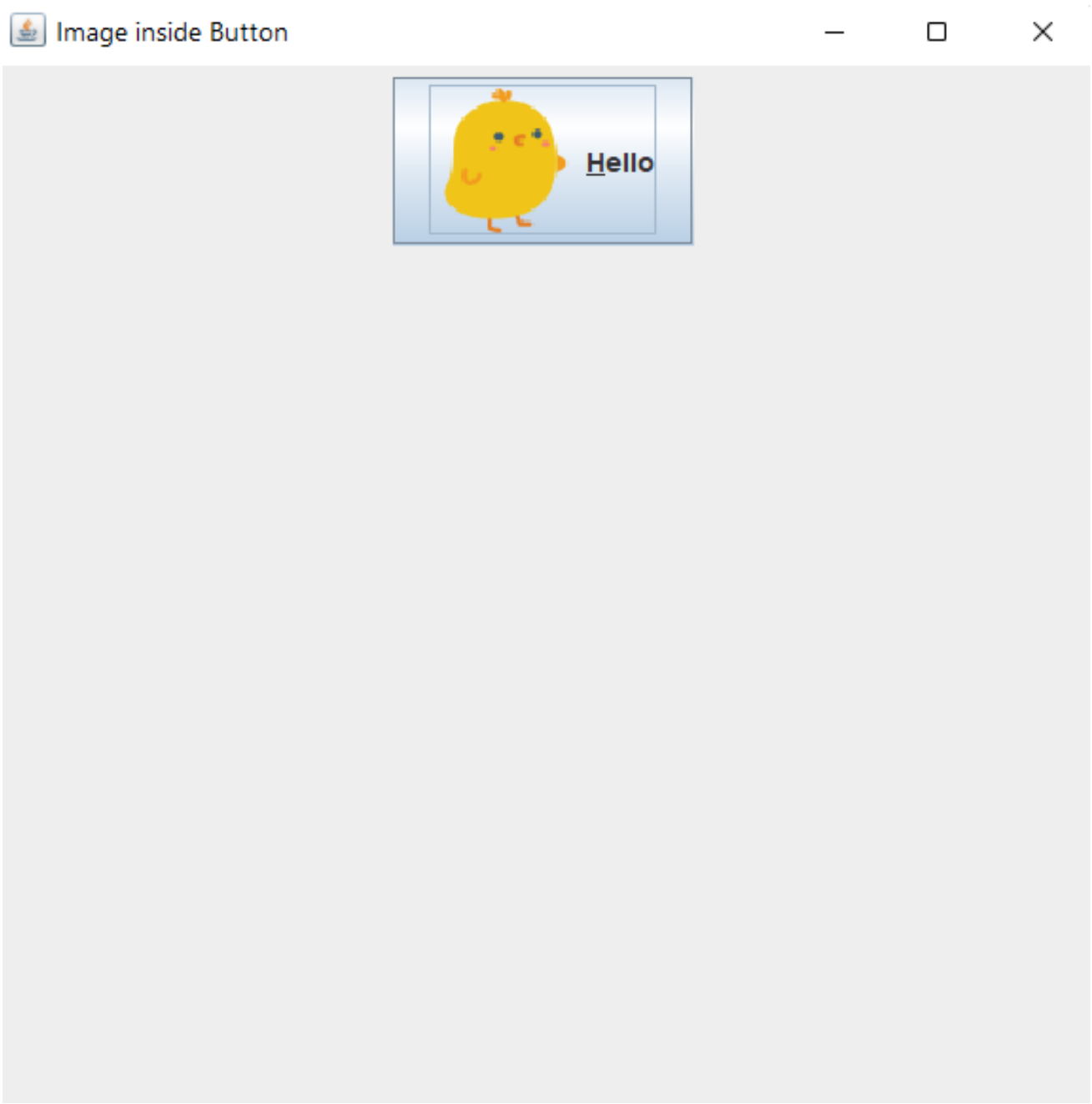
Jbutton : The JButton class is used to create a labeled button that has platform independent implementation. The application result in some action when the button is pushed. It inherits AbstractButton class.

Source Code:

```
import javax.swing.ImageIcon;

import javax.swing.JButton;

import javax.swing.JFrame;

import javax.swing.SwingUtilities;

import javax.swing.WindowConstants;
```

```
import java.awt.FlowLayout;

public class exp2 extends JFrame {
    public exp2() {
        initComponents();
    }

    public static void main(String[] args) {
        SwingUtilities.invokeLater(() -> new exp2().setVisible(true));
    }

    private void initComponents() {

        setTitle("Image inside Button");
        setSize(500, 500);

        setDefaultCloseOperation(WindowConstants.EXIT_ON_CLOSE);
        getContentPane().setLayout(new FlowLayout(FlowLayout.CENTER));

        JButton helloButton = new JButton("Hello", new ImageIcon(

                this.getClass().getResource("/images/hello.png")));
        helloButton.setMnemonic('H');

        getContentPane().add(helloButton);
    }
}
```

Output:



EXPERIMENT – 11.3

Aim:

Change the component color by choosing a color from ColorChooser.

Theory:

Java swing : Java Swing tutorial is a part of Java Foundation Classes (JFC) that is *used to create window-based applications*. It is built on the top of AWT (Abstract Windowing Toolkit) API and entirely written in java.Unlike AWT, Java Swing provides platform-independent and lightweight components. The javax.swing package provides classes for java swing API such as JButton, JTextField, JTextArea, JRadioButton, JCheckbox, JMenu, JColorChooser etc.

JFrame : The javax.swing.JFrame class is a type of container which inherits the java.awt.Frame class. JFrame works like the main window where components like labels, buttons, textfields are added to create a GUI. Unlike Frame, JFrame has the option to hide or close the window with the help of setDefaultCloseOperation(int) method

Jbutton : The JButton class is used to create a labeled button that has platform independent implementation. The application result in some action when the button is pushed. It inherits AbstractButton class.

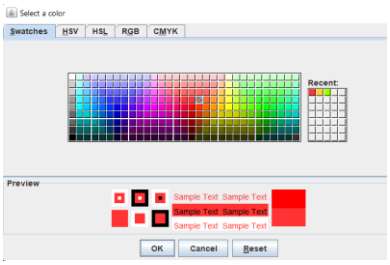
JColorChooser : The JColorChooser class is used to create a color chooser dialog box so that user can select any color. It inherits JComponent class.

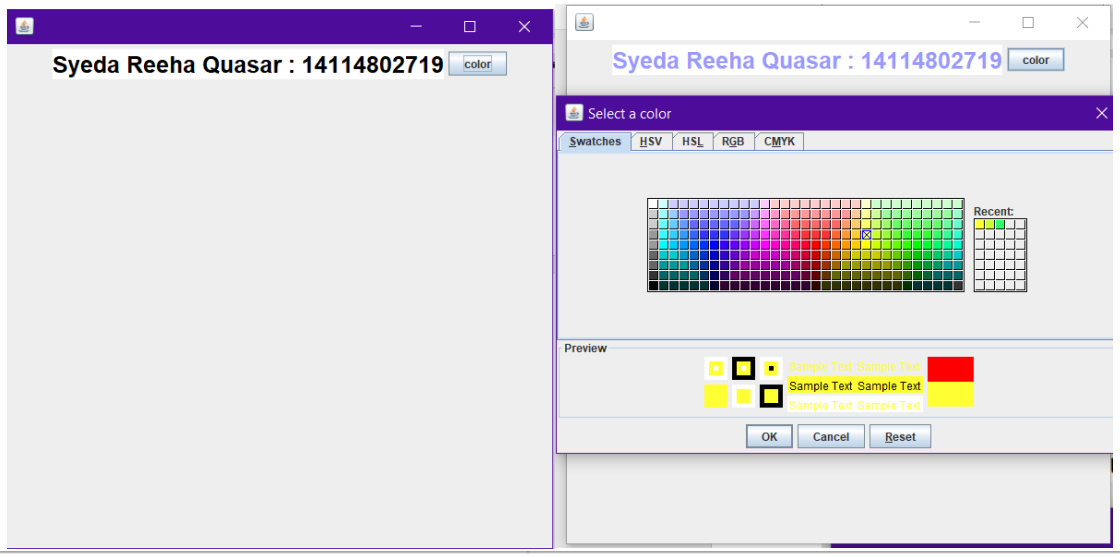
Source Code:

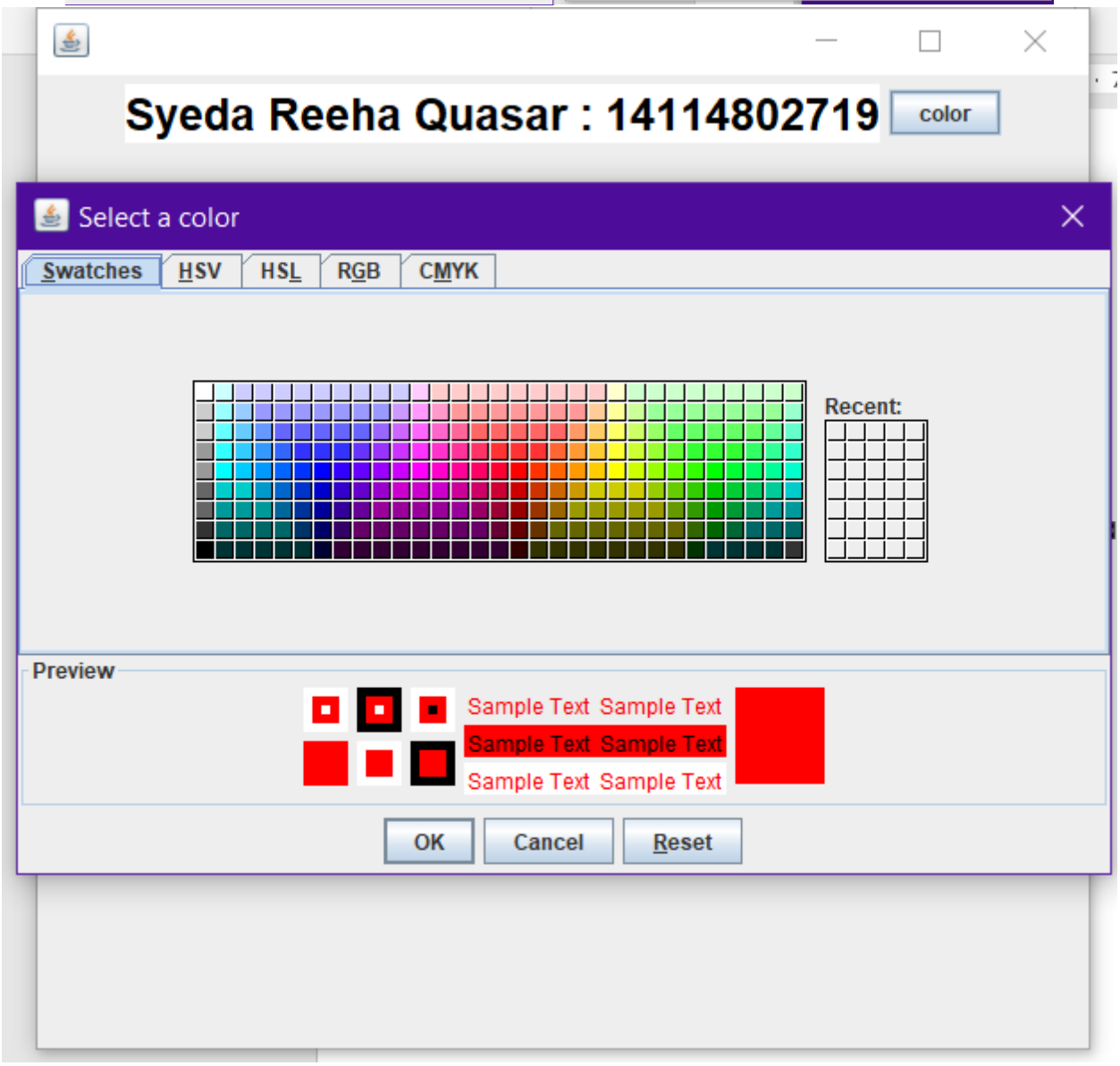
```
import java.awt.event.*;
import java.awt.*;
import javax.swing.*;
```

```
public class IOFile extends
        JFrame implements ActionListener {
    JButton b = new JButton("color");
    protected JLabel label;
    Container c = getContentPane();

    IOFile() {
        label = new JLabel("Syeda Reeha Quasar : 14114802719",
JLabel.CENTER);
        label.setForeground(Color.BLACK);
        label.setBackground(Color.WHITE);
        label.setOpaque(true);
        label.setFont(new Font("SansSerif", Font.BOLD, 25));

        c.setLayout(new FlowLayout());
        b.addActionListener(this);
        c.add(label);
        c.add(b);
    }

    public void actionPerformed(ActionEvent e) {
        Color initialcolor = Color.RED;
        Color color = JColorChooser.showDialog(this, "Select a color",
initialcolor);
        label.setForeground(color);
    }

    public static void main(String[] args) {
        IOFile ch = new IOFile();
        ch.setSize(400, 400);
        ch.setVisible(true);
        ch.setDefaultCloseOperation(EXIT_ON_CLOSE);
    }
}
```

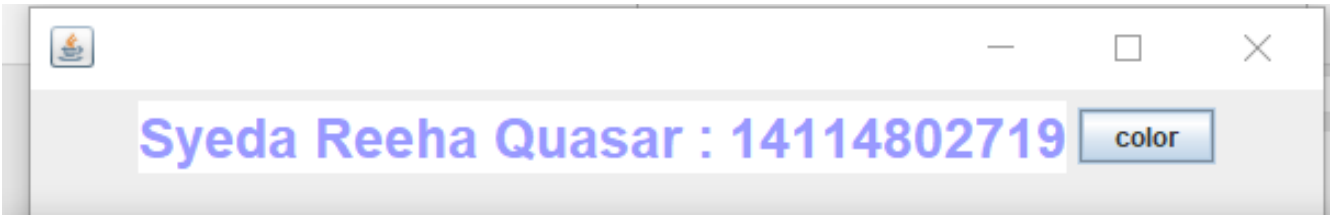
Output:




Syeda Reeha Quasar : 14114802719
color
Select a color
Swatches
HSV
HSL
RGB
CMYK
Recent:
Preview
Sample Text Sample Text
OK
Cancel
Reset


Syeda Reeha Quasar : 14114802719
color
Select a color
Swatches
HSV
HSL
RGB
CMYK
Recent:
Preview
Sample Text Sample Text
Sample Text Sample Text
Sample Text Sample Text
OK
Cancel
Reset


Syeda Reeha Quasar : 14114802719
color


Syeda Reeha Quasar : 14114802719
color

EXPERIMENT – 11.4

Aim:

Display the digital watch in swing tutorial.

Theory:

Java swing : Java Swing tutorial is a part of Java Foundation Classes (JFC) that is *used to create window-based applications*. It is built on the top of AWT (Abstract Windowing Toolkit) API and entirely written in java.Unlike AWT, Java Swing provides platform-independent and lightweight components. The javax.swing package provides classes for java swing API such as JButton, JTextField, JTextArea, JRadioButton, JCheckbox, JMenu, JColorChooser etc.

Thread : Threads allows a program to operate more efficiently by doing multiple things at the same time. Threads can be used to perform complicated tasks in the background without interrupting the main program.

JFrame : The javax.swing.JFrame class is a type of container which inherits the java.awt.Frame class. JFrame works like the main window where components like labels, buttons, textfields are added to create a GUI. Unlike Frame, JFrame has the option to hide or close the window with the help of setDefaultCloseOperation(int) method

Jbutton : The JButton class is used to create a labeled button that has platform independent implementation. The application result in some action when the button is pushed. It inherits AbstractButton class.

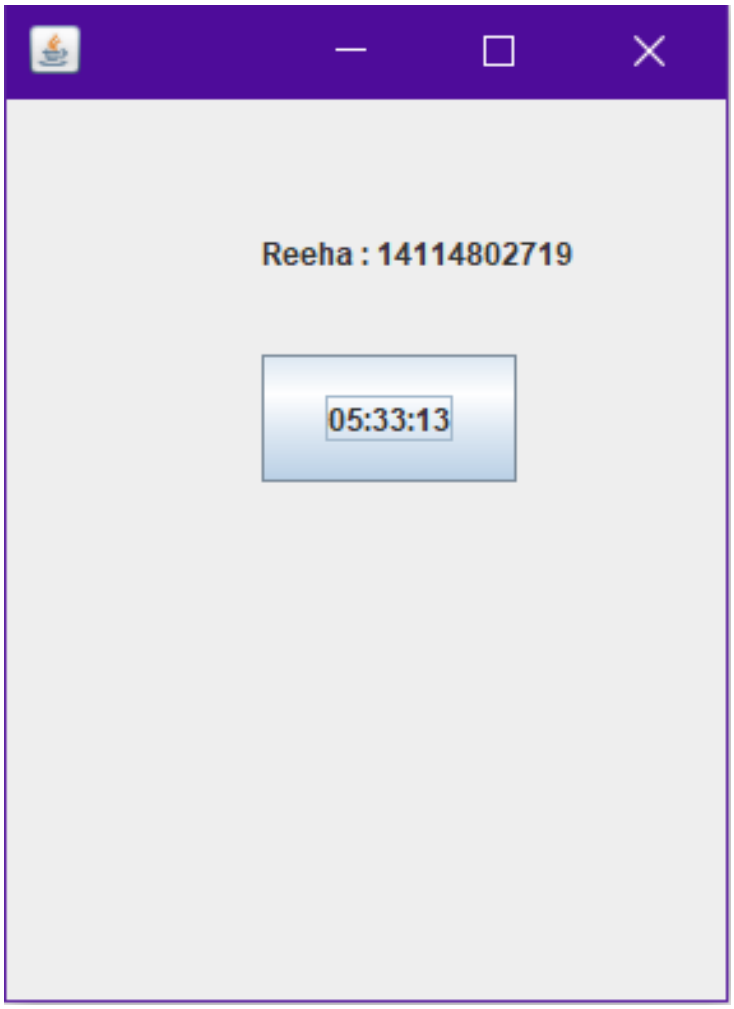
Source Code:

```
import javax.swing.*;
import java.awt.*;
import java.text.*;
import java.util.*;
```

```
public class IOFile implements Runnable {
    JFrame f;
    Thread t = null;
    int hours = 0, minutes = 0, seconds = 0;
    String timeString = "";
    JButton b;
    JLabel l1;

    IOFile() {
        f = new JFrame();

        t = new Thread(this);
        t.start();
        b = new JButton();
        b.setBounds(100, 100, 100, 50);
        l1 = new JLabel("Reeha : 14114802719");
        l1.setBounds(100, 10, 170, 100);

        f.add(l1);
        f.add(b);
        f.setSize(300, 400);
        f.setLayout(null);
        f.setVisible(true);
    }

    public void run() {
        try {
            while (true) {

                Calendar cal = Calendar.getInstance();
                hours = cal.get(Calendar.HOUR_OF_DAY);
                if (hours > 12)
                    hours -= 12;
                minutes = cal.get(Calendar.MINUTE);
                seconds = cal.get(Calendar.SECOND);

                SimpleDateFormat formatter = new
SimpleDateFormat("hh:mm:ss");
                Date date = cal.getTime();
                timeString = formatter.format(date);
                printTime();
                t.sleep(1000);
            }
        } catch (Exception e) {
```

```
        }
    }

    public void printTime() {
        b.setText(timeString);
    }

    public static void main(String[] args) {
        new IOFile();

    }
}
```

Output:



EXPERIMENT – 11.5

Aim:

Create a notepad in swing.

Theory:

Java swing : Java Swing tutorial is a part of Java Foundation Classes (JFC) that is *used to create window-based applications*. It is built on the top of AWT (Abstract Windowing Toolkit) API and entirely written in java.Unlike AWT, Java Swing provides platform-independent and lightweight components. The javax.swing package provides classes for java swing API such as JButton, JTextField, JTextArea, JRadioButton, JCheckbox, JMenu, JColorChooser etc.

JFrame : The javax.swing.JFrame class is a type of container which inherits the java.awt.Frame class. JFrame works like the main window where components like labels, buttons, textfields are added to create a GUI. Unlike Frame, JFrame has the option to hide or close the window with the help of setDefaultCloseOperation(int) method

Jbutton : The JButton class is used to create a labeled button that has platform independent implementation. The application result in some action when the button is pushed. It inherits AbstractButton class.

Source Code:

```
import java.awt.*;
import java.awt.datatransfer.Clipboard;
import java.awt.datatransfer.DataFlavor;
import java.awt.datatransfer.Transferable;
import java.awt.event.*;
import java.io.File;
import java.io.PrintWriter;
import java.util.Scanner;
```

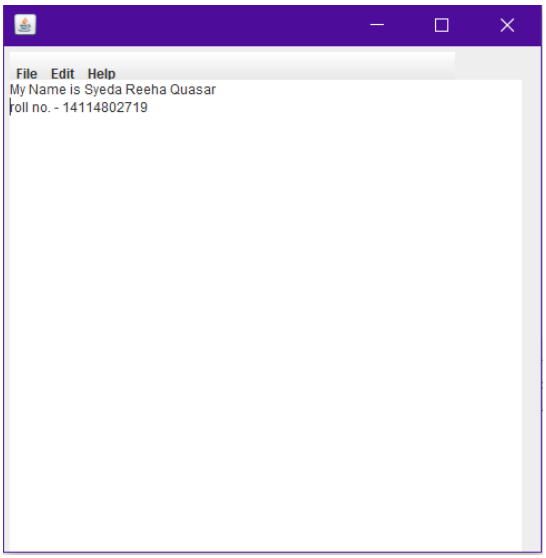
```
import javax.swing.*;

public class Notepad extends JFrame {

    private static final long serialVersionUID = 1L;
    JFrame frame;
    JMenuBar menuBar;
    JMenu file;
    JMenu edit;
    JMenuItem open, newFile, save, exit;
    JMenuItem undo, paste, selectAll;
    JMenu format;
    JMenu help;
    JFileChooser fileChooser;
    JTextArea textArea;
    Clipboard clip;

    Notepad() {
        frame = new JFrame("Notepad Application");
        file = new JMenu("File");
        edit = new JMenu("Edit");
        format = new JMenu("Format");
        help = new JMenu("Help");

        newFile = new JMenuItem("New");
        open = new JMenuItem("Open");
        save = new JMenuItem("Save");
        exit = new JMenuItem("Exit");
        undo = new JMenuItem("Undo                 Ctrl+Z");
        paste = new JMenuItem("Paste                Ctrl+V");
        selectAll = new JMenuItem("Select All       Ctrl+A ");
        textArea = new JTextArea();
        fileChooser = new JFileChooser();
        menuBar = new JMenuBar();

        frame.setLayout(new BorderLayout());
        frame.setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);

        frame.add(textArea);
        file.add(open);
        file.add(newFile);
        file.add(save);
        file.add(exit);
        edit.add(undo);
```

```
        edit.add(paste);
        edit.add(selectAll);
        menuBar.add(file);
        menuBar.add(edit);
        menuBar.add(format);
        menuBar.add(help);

        frame.setJMenuBar(menuBar);

        OpenListener openL = new OpenListener();
        NewListener NewL = new NewListener();
        SaveListener saveL = new SaveListener();
        ExitListener exitL = new ExitListener();
        open.addActionListener(openL);
        newFile.addActionListener(NewL);
        save.addActionListener(saveL);
        exit.addActionListener(exitL);
        // UndoListener UndoL = new UndoListener();
        PasteListener pasteL = new PasteListener();
        // EditListener EditL = new EditListener();
        // SelectListener SelectL = new SelectListener();
        // undo.addActionListener(UndoL);
        // paste.addActionListener(EditL);
        // selectAll.addActionListener(SelectL);
        frame.setSize(800, 600);
        frame.setVisible(true);
    }

    class OpenListener implements ActionListener {
        public void actionPerformed(ActionEvent e) {
            if (JFileChooser.APPROVE_OPTION == fileChooser.showOpenDialog(frame))
{
                File file = fileChooser.getSelectedFile();
                textArea.setText("");
                Scanner in = null;
                try {
                    in = new Scanner(file);
                    while (in.hasNext()) {
                        String line = in.nextLine();
                        textArea.append(line + "\n");
                    }
                } catch (Exception ex) {
                    ex.printStackTrace();
                } finally {
                    in.close();
```

```
                }
            }
        }
    }

    class SaveListener implements ActionListener {
        public void actionPerformed(ActionEvent e) {
            if (JFileChooser.APPROVE_OPTION == fileChooser.showSaveDialog(frame))
{
                File file = fileChooser.getSelectedFile();
                PrintWriter out = null;
                try {
                    out = new PrintWriter(file);
                    String output = textArea.getText();
                    System.out.println(output);
                    out.println(output);
                } catch (Exception ex) {
                    ex.printStackTrace();
                } finally {
                    try {
                        out.flush();
                    } catch (Exception ex1) {

                    }
                    try {
                        out.close();
                    } catch (Exception ex1) {

                    }
                }
            }
        }
    }

    class NewListener implements ActionListener {
        public void actionPerformed(ActionEvent e) {
            textArea.setText("");
            // frame.add(newFile);
            // textArea.(newFile+"\n");

        }
    }

    class ExitListener implements ActionListener {
        public void actionPerformed(ActionEvent e) {
```

```
            System.exit(0);
        }
    }

    class PasteListener implements ActionListener {
        public void actionPerformed(ActionEvent e) {
            Transferable cliptran = clip.getContents(Notepad.this);
            try {
                String sel = (String)
cliptran.getTransferData(DataFlavor.stringFlavor);
                textArea.replaceRange(sel, textArea.getSelectionStart(),
textArea.getSelectionEnd());
            } catch (Exception exc) {
                System.out.println("not string flavour");
            }

        }
    }

    public static void main(String args[]) {
        Notepad n = new Notepad();
    }
}
```

Output:



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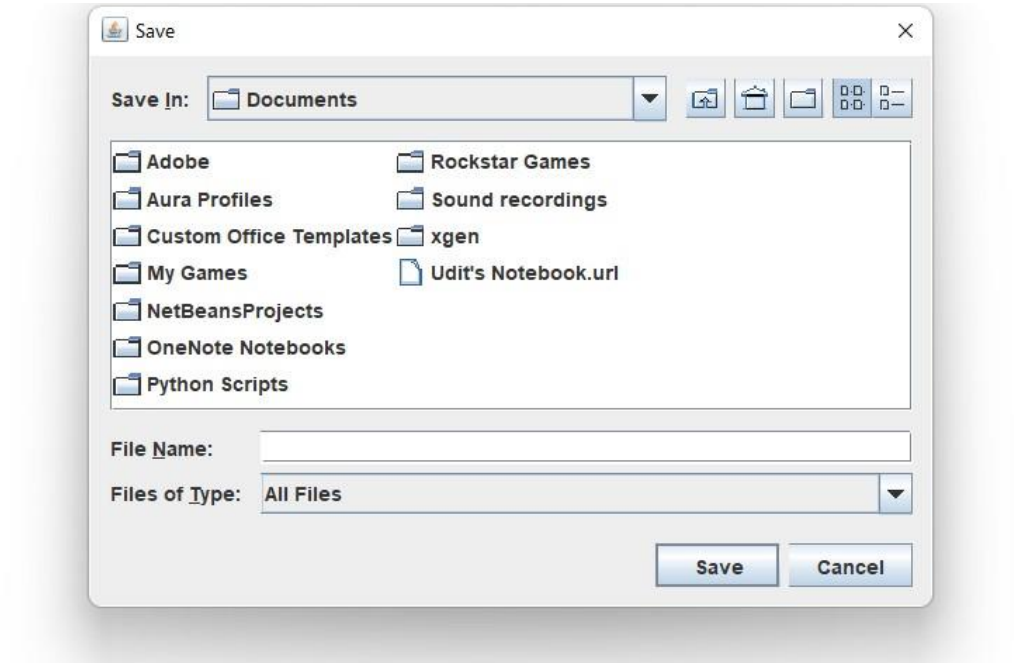

Viva Questions

1. What is Java Swing?

Ans.

It is a part of JFC (Java Foundation Classess) that is used to create window-based applications.

Java Swing components are platform independent and lightweight .

2. What are the methods of component class in Java Swing?

Ans.

There are four types of methods of component class are:

- public void add(Component c)
- public void setSize(int width, int height)
- public void setLayout(LayoutManager m)
- public void setVisible(boolean b)

3. How many ways to create a frame in Java Swing ? Ans.

There are two ways to create a frame:

- By Association(creating the object of Frame class)
- By Inheritance(extending Frame class)

4. What are differences between Swing and AWT?

Ans.

There is couple of differences between swing and AWT.

- AWT component are considered to be heavyweight while Swing component are lightweights.
- Swing has plug gable look and feel.
- AWT is platform dependent same GUI will look different platform while Swing is developed in Java and is platform dependent.

5. True of false: An applet can run multiple threads.

Ans.

True. The paint and update methods are always called from the AWT drawing and event handling thread. You can have your applet create additional threads, which is recommended for performing time-consuming tasks.